2013 City of Glendale Bicycle and Pedestrian Report

FINAL

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1 EXECUTIVE SUMMARY

The purpose of this report is to identify key trends in bicycling and walking activity in Glendale. Using data from the California Statewide Integrated Traffic Records System (SWITRS), the report also provides a basic assessment of Glendale's bicycling and walking safety statistics. To keep these metrics in perspective, a chapter comparing Glendale's bicycling and walking activity and collisions statistics to those of several peer cities is also included.

The 2013 count methodology changed significantly from previous years. In 2012, the Southern California Association of Governments (SCAG) and the Los Angeles County Metropolitan Transportation Authority (Metro) created a Bike Count Data Clearinghouse. In so doing, they created a standard counting methodology and associated counting forms and instructions. In order to be consistent with other regional counts, Glendale adopted the SCAG/Metro methodology for 2013. Because of the methodological change, limited comparisons are available between the 2009/2010 data and the 2013 counts. Moving forward, the 2013 data will serve as a baseline for comparison between peer cities and between future years' counts.

Key Findings

1. **Bicycle volumes in Glendale increased by 36% between 2013 and 2010. Pedestrian volumes showed a slight decline.** Due to the change in methodology in 2013, the measured percentage changes should only be treated as rough estimates.
2. **The highest-volume bicyclist and pedestrian intersections remained generally the same between 2010 and 2013.** For bicyclists, one intersection stood out for its increase of observed bicyclists—Honolulu and Verdugo. Bicycle route signage and sharrows were recently implemented nearby as part of the Bicycle Transportation Plan.
3. **Thirty two percent of observed bicyclists were not wearing a helmet.** This is similar to what was observed in 2010.
4. **Nineteen percent of observed cyclists were riding on the sidewalk.** This is similar to what was observed in 2010.
5. **Only 10% of bicyclists were female; children were underrepresented among observed bicyclists.** This may suggest that additional infrastructure is needed to attract bike riders at all levels of ability. Two percent of pedestrians were observed using a mobility aid such as a wheelchair.
6. **The number of bicyclist injury collisions increased between 2007 and 2011 by 65.9%; pedestrian injury collisions decreased by 9.7%.** This observation is consistent with the counts data, which showed a 36% increase in bicycling and 3% decrease in walking between 2010 and 2013.
7. **Since the 2007-2011 timeframe, the City has reported six fatal pedestrian collisions in 2013 and one fatal bicycle collision in 2014.** The more recent number of fatal bicycle and pedestrian collisions warrants additional evaluation and planning for

significant safety improvements to Glendale's bicycling and walking infrastructure and an expansion of its educational campaigns and programs.

8. **The locations with the most pedestrian collisions remained more consistent over time than did bicyclist injury locations.** This may reflect the general trends in overall bicycling and walking in Glendale. Bicycling behavior is growing, suggesting that motor vehicle users may not be accustomed to sharing the streets with bicyclists and new bicyclists may be less experienced at navigating urban street dynamics. This could mean that the locations for bicycle collisions are less stable during the period of growth. Four of the top ten pedestrian injury collision locations between 2007 and 2011 were also in the top ten between 2004 and 2009. Only one location remained consistent for bicyclist collisions.
9. **Pedestrian collisions were mostly due to driver violations of the pedestrian right-of-way[1], but bicyclist collisions were less focused on one factor.** For bicyclists, the top two primary collision factors were traveling on the wrong side of the road and automobile right-of-way violations.
10. **People involved in bicyclist collisions were predominantly male, reflecting the low proportion of females among bicyclists in Glendale.**
11. **Seniors (aged 65 and older) were greatly overrepresented among pedestrian collisions.**

Key Recommendations

1. **Continue to conduct the bicycle and pedestrian counts at least every two years, but ideally annually.** The data should be made public as soon as possible after the count period. An accompanying report summarizing the key findings from the annual counts should be produced at least every two years. Above all, maintain consistency with count methodology, locations, and times to facilitate longitudinal comparisons of volumes.
2. **Evaluate the purchase of automatic counters in the context of limited resources.** Automatic counting technology cannot track the specifics of bicyclist and pedestrian behavior, gender, and age, but they can supplement manual counts and provide detailed longitudinal data.
3. **Utilize count and collision data to prioritize implementation of the Bicycle Transportation Plan, bicycle and pedestrian programs, educational programs focused on improving safety for all modes, and other policies.** The analysis in this report suggests that targeted bicycle and pedestrian safety education and enforcement efforts are potential priority projects.
4. **Utilize count and collision data to secure additional funding.**
5. **Supplement count and collision data with other local, regional, and national data sources and continue to participate in the SCAG/Metro Bike Count Data Clearinghouse.**
6. **Utilize regional data from the Bike Count Data Clearinghouse to create a model of bicycling and walking that can be applied citywide.**
7. **Communicate and advertise the measured increase in bicycling to encourage more non-motorized travel.**

[1] A "pedestrian right-of-way" violation refers to a situation in which a vehicle violates the right-of-way of a pedestrian (e.g. a pedestrian using a crosswalk)

2 INTRODUCTION

The primary objective of this report is to analyze bicycle and pedestrian count data gathered in 2013, including identifying basic trends from the previous years of collected data (2009 and 2010). Data was analyzed at the macro level (citywide) and the micro level (at specific intersections), as well as in relation to certain bicyclist and pedestrian behaviors. The ultimate goal of this report is to provide City staff with information that can then be used to inform decisions about how to plan for future projects and where to invest resources to further enhance bicycling and pedestrian infrastructure and programs in Glendale.

As discussed in detail in Chapter 3, the primary count methodology utilized in 2013 was changed from previous years to ensure consistent data collection across jurisdictions in the Los Angeles region. The new methodology was determined by the Southern California Association of Governments (SCAG) and the Los Angeles Metropolitan Transportation Authority (Metro). In 2009 and 2010, counts were conducted using an "intersection" methodology, while a "screenline" methodology was utilized in 2013. The change in methodologies meant that only a subset of the 2013 data could be utilized for comparisons with 2009 and 2010. Moving forward, the 2013 data will establish a baseline for future screenline counts.

Another objective of this report was to provide a basic assessment and profile of bicyclist and pedestrian safety in the City of Glendale. Nelson\Nygaard analyzed five years (2007-2011) of bicycle and pedestrian collision data and summarized key trends related to number of collisions, collision severity, most frequent collision locations, primary collision factors, vehicle code violations, and basic demographics of injured parties. This information can also serve as a reference for ongoing and future safety assessments.

A further objective of this report was to look at Glendale's bicycle and pedestrian data in comparison to selected geographic peers. More specifically, how does Glendale's number of bicyclists and pedestrians compare with other geographic peers? Also, does Glendale have a higher number of bicycle and pedestrian collisions in comparison to other peers? This report seeks to provide preliminary answers to those questions.

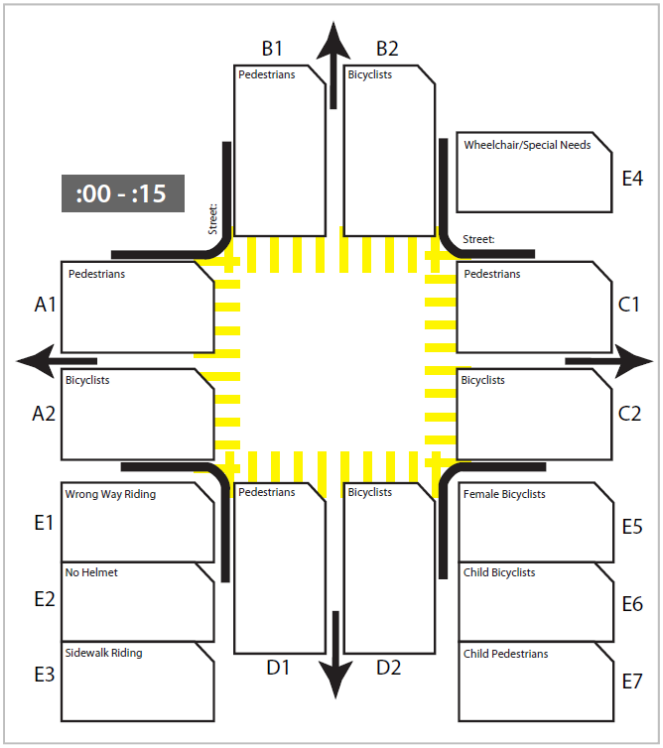
Finally, this report provides some basic recommendations for how to utilize the analyzed data and how to ensure that future count efforts are as useful as possible.

3 COUNT METHODOLOGY

The count methodology changed significantly in 2013 as part of a region-wide effort to standardize the collection of bicycle and pedestrian data. Sponsored by the Los Angeles County Metropolitan Transportation Authority and the Southern California Association of Governments, the Data Clearinghouse Project "...seeks to compile, organize, make accessible, and create a data standard for bicycle count data collected in Los Angeles County."[2] In order to complete the counts in Glendale, Walk Bike Glendale worked in close collaboration with City staff and was instrumental in securing volunteers and providing training for the bicycle and pedestrian counts.

Previously, every bicyclist or pedestrian that *exited* an intersection was counted. As shown in Figure 3-1, surveyors would mark which leg of the intersection (A, B, C, or D) the bicyclist or pedestrian used to exit the intersection. For example, when a bicyclist entered the intersection from the south and exited to the east, they would have been counted in box C2 *only* because that is where they *exited*. No bicyclist or pedestrian was counted until they exited an intersection and they were counted regardless of the leg of the intersection they used to enter.

Figure 3-1 2010 Count Methodology



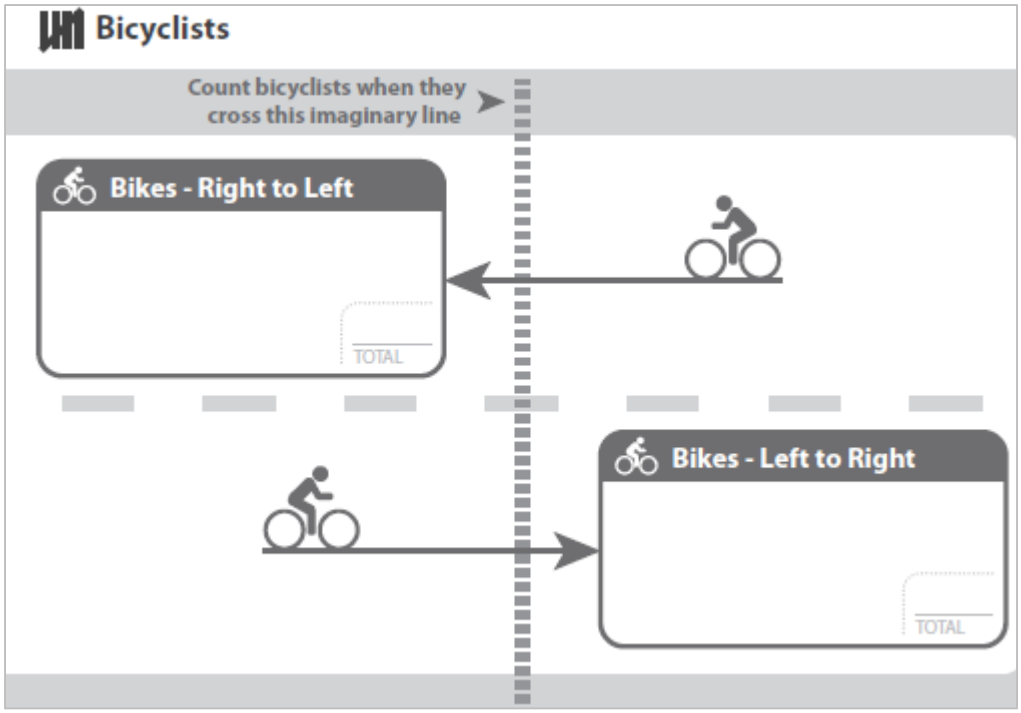
[2] www.lewis.ucla.edu/project/scag-bicycle-clearinghouse/

In 2013, for each intersection counted, a "screenline" was drawn at or near selected legs of the intersection. Bicyclists and pedestrians were counted as they crossed the screenline *in either direction* throughout a two-hour count period (weekdays 7-9 a.m., 5-7 p.m., or 3-5 p.m. and weekends 10 a.m. – 12 p.m.). Unlike previous years, not all legs of an intersection were assessed. This method is illustrated in Figure 3-2.

Each count period was divided into eight fifteen-minute segments. For bicyclists, information about gender, sidewalk riding, wrong-way riding, and helmet use was also recorded; for pedestrians, wheelchair use, skateboard/scooter/skates use, and whether or not the pedestrian was a child was also recorded. These characteristics were not tracked by 15-minute segment or by screenline, but rather for the two-hour count period overall.

The change in methodology means that counts from 2009 or 2010 are *not directly comparable* to counts from 2013. However, one can document basic trends in bicycle and pedestrian activity by looking at a subset of 2009, 2010, and 2013 volumes. Figure 3-3 shows which subset of data was compared between years.

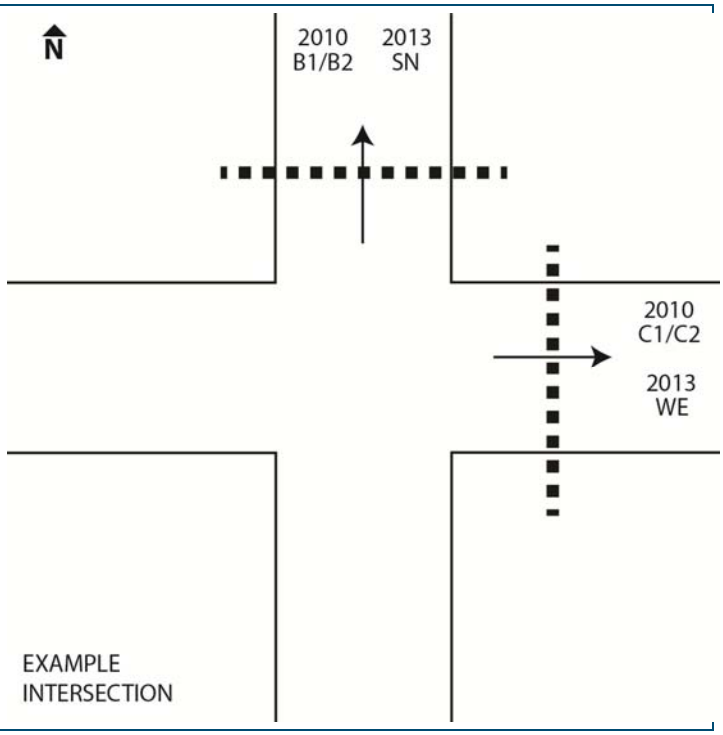
Figure 3-2 2013 Count Methodology[3]



[3] Complete count form shown in Appendix E.

Figure 3-3 2009/2010 to 2013 Conversion Table and Example

2009/2010 Subset of Counts	2013 Equivalent Subset of Counts
A1/A2	EW for west-side exit
B1/B2	SN for north-side exit
C1/C2	WE for east-side exit
D1/D2	NS for south-side exit



Count Locations

In 2013, a total of 30 intersections, corresponding to 55 screenlines, were observed. Figure 3-4 and Figure 3-5 map and list the screenline locations. These locations were identified primarily to match those counted in previous years, with a few differences:

- Broadview and Oceanview was counted in 2009, but not in 2010 nor in 2013
- Canada/Verdugo/Menlo was counted in 2009 and 2010, but not in 2013
- The following intersections were counted in 2013, but not in previous years:
  - Canada/Verdugo/Towne
  - Brand and Harvard
  - Fairmont and Flower
  - Glendale Riverwalk Bicycle Path
  - Broadway and Maynard

Figure 3-4 2013 Count Locations

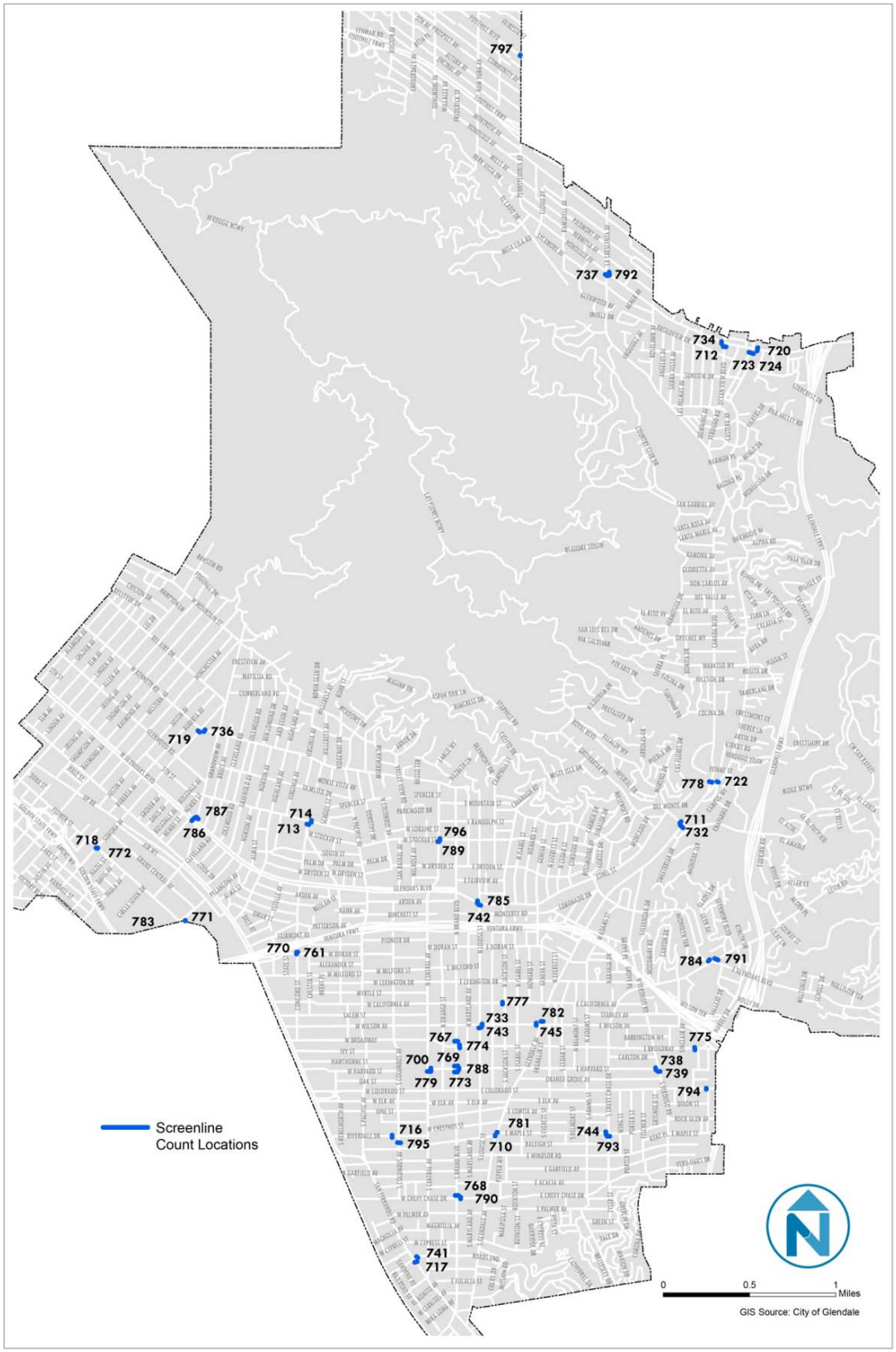


Figure 3-5 2013 Count Locations

2013 Screenline IDs[4]	Intersection	2013 Screenline IDs	Intersection
767, 774	Brand & Broadway	737, 792	Honolulu & La Crescenta
768, 790	Brand & Chevy Chase	712, 734	Honolulu & Oceanview
700, 779	Central & Americana Way	720, 724	Honolulu & Verdugo
789, 796	Central & Stocker	777	Jackson & California
794	Colorado & Lincoln	719, 736	Kenneth & Sonora
716, 795	Columbus & Riverdale	733, 743	Louise & Wilson
761, 770	Concord & Doran*	744, 793	Maple & Chevy Chase
713, 714	Concord & Glenwood (HS)	717, 741	San Fernando & Los Feliz
718, 772	Flower & Sonora	738, 739	Verdugo & Harvard (HS)
797	Foothill & Pennsylvania	711, 732	Verdugo & Mountain
710, 781	Glendale & Maple	722, 778	Verdugo/Canada/Towne
745, 782	Glendale & Wilson	769, 773, 788	Brand & Harvard
784, 791	Glenoaks & Chevy Chase	771	Fairmont & Flower
786, 787	Glenoaks & Grandview	783	Glendale Riverwalk Bicycle Path
742, 785	Glenoaks & Louise	775	Broadway & Maynard

Count Dates and Times

September is the preferred month for bicycle and pedestrian counts. Counting in September helps to reduce variation in travel patterns due to summer vacations and weather amenable to bicycle and pedestrian travel. In 2013, data was collected primarily on Wednesday, September 25th and Saturday, September 28th. All counts were conducted between September 19th and October 28th, 2013.

Counting in the middle of the week helps to eliminate variation of commute patterns due to extended weekends or holidays. For Glendale, primary counts were performed during three time periods: weekday morning (7-9 a.m.), weekday evening (5-7 p.m.), and weekend late morning (10 a.m. - 12 p.m.). Counts at two intersections, located adjacent to schools, were conducted between 3 p.m. and 5 p.m. on a weekday.

Figure 3-6 provides an overview of the count locations and times.

[4] The numbering of the screenline IDs is based on the Bike Count Data Clearinghouse methodology, co-sponsored by UCLA, the Southern California Association of Governments, and the Los Angeles County Metropolitan Transportation Authority. More information is available at http://www.bikecounts.luskin.ucla.edu/.

Figure 3-6 2013 Count Locations and Time Periods

2013 Screenline IDs	Intersection	Weekday (AM/PM)	Weekend (AM)	Weekday (PM – School)
767, 774	Brand & Broadway	X	X	
768, 790	Brand & Chevy Chase	X	X	
700, 779	Central & Americana Way	X	X	
789, 796	Central & Stocker	X	X	
794	Colorado & Lincoln	X	X	
716, 795	Columbus & Riverdale	X	X	
761, 770	Concord & Doran	X	X	
713, 714	Concord & Glenwood (HS)*			X
718, 772	Flower & Sonora	X	X	
797	Foothill & Pennsylvania**	X (a.m. only)	X	
710, 781	Glendale & Maple	X	X	
745, 782	Glendale & Wilson	X	X	
784, 791	Glenoaks & Chevy Chase	X	X	
786, 787	Glenoaks & Grandview	X	X	
742, 785	Glenoaks & Louise	X	X	
737, 792	Honolulu & La Crescenta	X	X	
712, 734	Honolulu & Oceanview	X	X	
720, 724	Honolulu & Verdugo	X	X	
777	Jackson & California	X	X	
719, 736	Kenneth & Sonora	X	X	
733, 743	Louise & Wilson	X	X	
744, 793	Maple & Chevy Chase	X	X	
717, 741	San Fernando & Los Feliz	X	X	
738, 739	Verdugo & Harvard (HS)*			X
711, 732	Verdugo & Mountain	X	X	
722, 778	Verdugo/Canada/Towne	X	X	
769, 773, 788	Brand & Harvard	X	X	
771	Fairmont & Flower	X	X	
783	Glendale Riverwalk Bicycle Path	X	X	
775	Broadway & Maynard	X	X	

*High School locations were only counted on weekdays between 3 p.m. and 5 p.m.
**The weekday p.m. count form for screenline #797 is missing and cannot be accounted for.

Limitations of Counts

Bicycle and pedestrian counts are a very useful tool in obtaining data regarding the usage of these modes and certain travel behaviors. It is important to note, however, that these bicycle and pedestrian counts are not meant to measure the *exact* number of people who bicycle or walk in Glendale, nor are they intended to determine the proportion of all trips made on bicycle or foot.

Given that these counts occur once a year and over a one day period, they are more useful in providing a "snapshot" that enables the identification of basic trends in bicycle and pedestrian travel over time. The National Bicycle and Pedestrian Documentation project[5] has developed a methodology to estimate daily, monthly, or annual users based on the extrapolation of data obtained from counts. However, this methodology is best used when data from three consecutive count days can be averaged.

For these reasons, identifying the exact level of bicycle ridership or number of pedestrians in Glendale can be better accomplished through a combination of U.S. Census data, National Household Travel Survey (NHTS) data, or a statistically representative survey of residents and visitors. These additional sets of data also can validate local count efforts and/or provide a more complete understanding of bicycle and pedestrian volumes. Still, local annual bicycle and pedestrian counts are critical for understanding dynamics at specific locations, which inform future network safety improvements or other enhancements.

[5] http://bikepeddocumentation.org/

4 KEY FINDINGS – BICYCLE AND PEDESTRIAN COUNTS

This section identifies key trends in bicycling and pedestrian activity, bicyclist behavior, and selected characteristics of these users. The data and analysis presented in this chapter are organized in the following manner:

- Note on Volumes
- Bicycle Volumes
- Pedestrian Volumes
- Peak-hour Volumes
- Weekday vs. Weekend Volumes
- Volumes by Geographic Region
- Bicyclist Behavior
- Bicyclist and Pedestrian Characteristics

Note on Volumes

It is important to reiterate that a direct comparison between 2009/2010 count data and 2013 count data is challenging. For overall volumes, a subset of the data was analyzed in order to determine a trend in activity between the current and historical count periods. The comparisons should be treated only as a rough estimate of the true underlying trends.

To ensure accurate comparisons across time and to avoid the omission of data, it is crucial that future count efforts maintain consistent count locations and methodology. This recommendation is discussed in additional detail in Chapter 7. Going forward, the 2013 data will serve as a baseline for future count efforts.

In addition to the limitations of this year's comparative analysis, there are general caveats to keep in mind when drawing conclusions from count data. First and foremost, the number of bicyclists and pedestrians counted at a given location naturally will vary from day to day; several factors including weather, people's individual schedules, planned events in the city, or temporary traffic routing changes cause this variation. Therefore, what could seem like a meaningful variation measured by one day's count as compared to a previous year could actually just represent some natural variation. The best way to overcome this challenge is to conduct counts on consecutive days in consecutive weeks and to average the data, an approach that is difficult while using volunteer staff to conduct the counts.

Figure 4-1 shows the comparable subset of bicycle and pedestrian volumes from 2009, 2010, and 2013. The percent change reflects the differences between 2010 and 2013. Total volumes for 2013 are shown in Appendix B.

Figure 4-1 Comparable 2009, 2010, and 2013 Bicycle and Pedestrian Volumes

Intersection	Comparable Data (All Time Periods)											
	Bicyclists				Pedestrians				Combined			
	2009	2010	2013	% change ('10 vs. '13)	2009	2010	2013	% change ('10 vs. '13)	2009	2010	2013	% change ('10 vs. '13)
Brand & Broadway	41	58	62	7%	1,368	1,397	1,082	-23%	1,409	1,455	1,144	-21%
Brand & Chevy Chase	60	40	46	15%	481	337	333	-1%	541	377	379	1%
Broadview & Oceanview	9	n/a	n/a	-	211	n/a	n/a	-	220	n/a	n/a	-
Canada/Verdugo/Menlo	56	59	n/a	-	44	82	n/a	-	100	141	n/a	-
Central & Americana Way*	n/a	35	36	3%	n/a	1,725	1,705	-1%	n/a	1,760	1,741	-1%
Central & Stocker	13	5	32	540%	447	457	352	-23%	460	462	384	-17%
Colorado & Lincoln	27	15	37	147%	116	126	194	54%	143	141	231	64%
Columbus & Riverdale	20	16	24	50%	418	272	388	43%	438	288	412	43%
Concord & Doran**	15	9	29	222%	71	60	73	22%	86	69	102	48%
Concord & Glenwood (HS)	4	16	6	-63%	825	834	589	-29%	829	850	595	-30%
Flower & Sonora	103	92	97	5%	78	124	75	-40%	181	216	172	-20%
Foothill & Pennsylvania***	23	13	15	15%	60	59	50	-15%	83	72	65	-10%

Intersection	Comparable Data (All Time Periods)											
	Bicyclists				Pedestrians				Combined			
	2009	2010	2013	% change ('10 vs. '13)	2009	2010	2013	% change ('10 vs. '13)	2009	2010	2013	% change ('10 vs. '13)
Glendale & Maple	43	37	35	-5%	325	302	455	51%	368	339	490	45%
Glendale & Wilson	31	48	41	-15%	765	747	597	-20%	796	795	638	-20%
Glenoaks & Chevy Chase	27	17	23	35%	130	108	119	10%	157	125	142	14%
Glenoaks & Grandview	36	37	72	95%	87	85	117	38%	123	122	189	55%
Glenoaks & Louise****	38	27	44	63%	222	179	140	-22%	260	206	184	-11%
Honolulu & La Crescenta	44	33	90	173%	110	109	128	17%	154	142	218	54%
Honolulu & Oceanview	48	42	75	79%	857	520	905	74%	905	562	980	74%
Honolulu & Verdugo	36	64	65	2%	177	172	179	4%	213	236	244	3%
Jackson & California*****	4	13	6	-54%	102	127	184	45%	106	140	190	36%
Kenneth & Sonora	23	22	40	82%	140	246	194	-21%	163	268	234	-13%
Louise & Wilson	24	11	26	136%	314	304	374	23%	338	315	400	27%
Maple & Chevy Chase	37	32	49	53%	319	271	301	11%	356	303	350	16%
San Fernando & Los Feliz	28	54	51	-6%	629	681	315	-54%	657	735	366	-50%

Intersection	Comparable Data (All Time Periods)											
	Bicyclists				Pedestrians				Combined			
	2009	2010	2013	% change ('10 vs. '13)	2009	2010	2013	% change ('10 vs. '13)	2009	2010	2013	% change ('10 vs. '13)
Verdugo & Harvard (HS)	22	16	12	-25%	804	854	745	-13%	826	870	757	-13%
Verdugo & Mountain	44	61	94	54%	200	234	455	94%	244	295	549	86%
Verdugo/Canada/Towne	n/a	n/a	117	-	n/a	n/a	542	-	n/a	n/a	659	-
Brand & Harvard	n/a	n/a	134	-	n/a	n/a	4,156	-	n/a	n/a	4,290	-
Fairmont & Flower	n/a	n/a	39	-	n/a	n/a	31	-	n/a	n/a	70	-
Glendale Riverwalk Bicycle Path	n/a	n/a	56	-	n/a	n/a	112	-	n/a	n/a	168	-
Broadway & Maynard	n/a	n/a	15	-	n/a	n/a	216	-	n/a	n/a	231	-
TOTAL (all locations)	856	872	1,463	68%	9,300	10,412	14,983	44%	10,156	11,284	16,446	46%
TOTAL (only locations counted in all years)	791	813	1,107	36%	9,045	10,330	10,049	-3%	9,836	11,143	11,156	0%

*2013 ped and bicycle volumes are missing 5-5:15 p.m. data

**2010 ped and bicycle volumes missing weekend 10 a.m. -12 p.m. data

***2013 ped and bicycle volumes missing 5-7 p.m. data

****2013 ped volumes missing weekend 10 a.m. -12 p.m. data for screenline location 785 only

*****2009 ped and bicycle volumes missing for weekend 10 a.m. -12 p.m.

Bicycle Volumes

Figure 4-1 shows a 36% increase in bicycling activity in 2013 as compared with 2010. The trend in bicycle volumes at each location, however, was highly variable. For example, the count at Central and Stocker in 2013 demonstrated a 540% increase over 2010 volumes (the largest increase observed), whereas at Concord and Glenwood (adjacent to Herbert Hoover High School), volumes decreased by 63% (the largest decrease observed). The locations with the five highest volumes recorded in 2013 each exhibited increases since 2010, ranging from 2% to 173%. Bicycle volumes, by intersection and time period, are provided as Appendix B.

The top five locations for bicycle activity are presented in Figure 4-2. The top location for bicycle activity for all three years—2009, 2010, and 2013—was the intersection of Flower and Sonora. Verdugo and Mountain had the second highest bicycle activity, as was the case in 2010.

A map of weekday bicycle volumes is provided as Figure 4-3. Observed bicycle activity is highest in the downtown core, but a few locations north of downtown (Flower and Sonora, Glenoaks and Grandview, and Verdugo and Mountain) also exhibited relatively high bicycle volumes.

It should be noted that two of the high volume locations recently received bicycle infrastructure improvements as part of implementing Phase I of the City of Glendale Bicycle Transportation Plan,[6] however each of these installations occurred after the September 2013 counts.[7] In January 2014, Class III Bikeways with route signage were implemented on Honolulu Avenue between Boston and Pennsylvania Avenues, Pennsylvania between North and South Honolulu Avenue, and Honolulu between Pennsylvania and Orangedale.

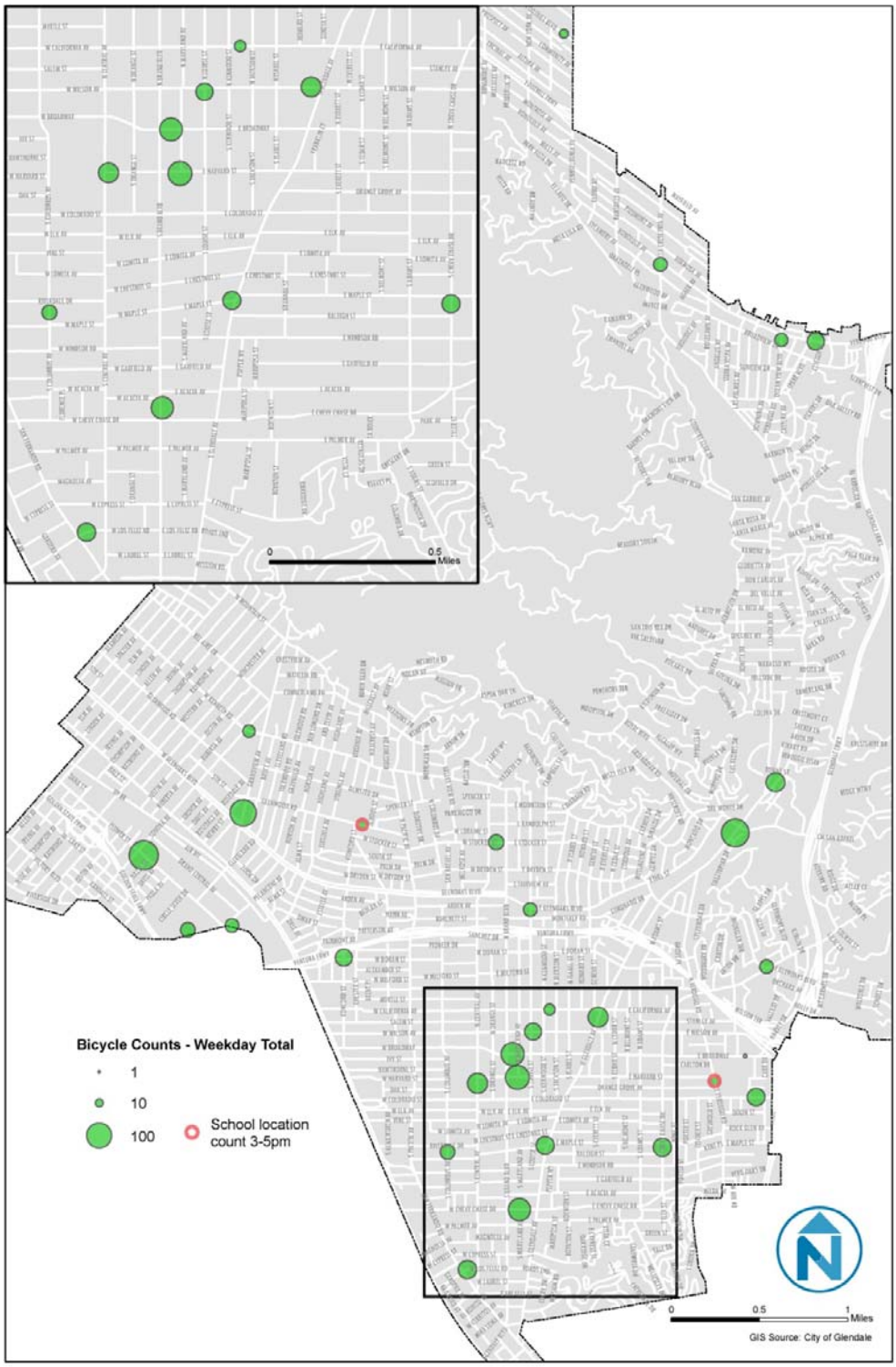
Figure 4-2 Top 5 Intersections, by Overall Bicyclist Volumes

Intersection	2009 Rank	2010 Rank	2013 Rank	Total Volume (All Time Periods)*
Flower & Sonora	1	1	1	237
Verdugo & Mountain	14	2	2	188
Honolulu & Verdugo	13	12	3	169
Brand & Harvard	-	-	4	134
Honolulu & La Crescenta	9	7	5	121
* Ranks based on overall counts for 2013 including all intersection legs counted and all time periods				

[6] Implementation of Glendale Bicycle Transportation Plan, Phase I. Agenda item available at http://www.ci.glendale.ca.us/government/council_packets/Reports_110513/CC_5c_110513.pdf

[7] City of Glendale Civil Engineering Division of Public Works.

Figure 4-3 Map of Count Locations with Bicycle Volumes, Weekday AM & PM, 2013[8]



[8] Figure 4-3 includes all weekday counts: 7-9 a.m., 5-7 p.m., and the two school locations measured only between 3-5 p.m.

Pedestrian Volumes

As shown in Figure 4-1, there was a small decrease in walking activity of 3% between 2010 and 2013. Like bicyclist volumes, the trend at individual locations was variable. The biggest increase in pedestrian volumes between 2010 and 2013 was observed at Verdugo Road and Mountain Street, where the volume of pedestrians increased 94%. The largest decrease was observed at San Fernando and Los Feliz, where pedestrian volumes decreased 54% between 2010 and 2013. The decrease in volumes at this location is likely due to the construction of the Glendale Triangle Mixed-Use Project, which has temporarily closed nearby sidewalks and relocated bus stops at this intersection.

The top locations for pedestrian activity have remained relatively consistent over the past several years (Figure 4-4). The location with the highest overall measured pedestrian volume in 2013 is also the fourth highest bicycle volume intersection: Brand and Harvard Street (adjacent to the Americana). Otherwise, there is no overlap between the top five pedestrian and bicycle volume intersections.

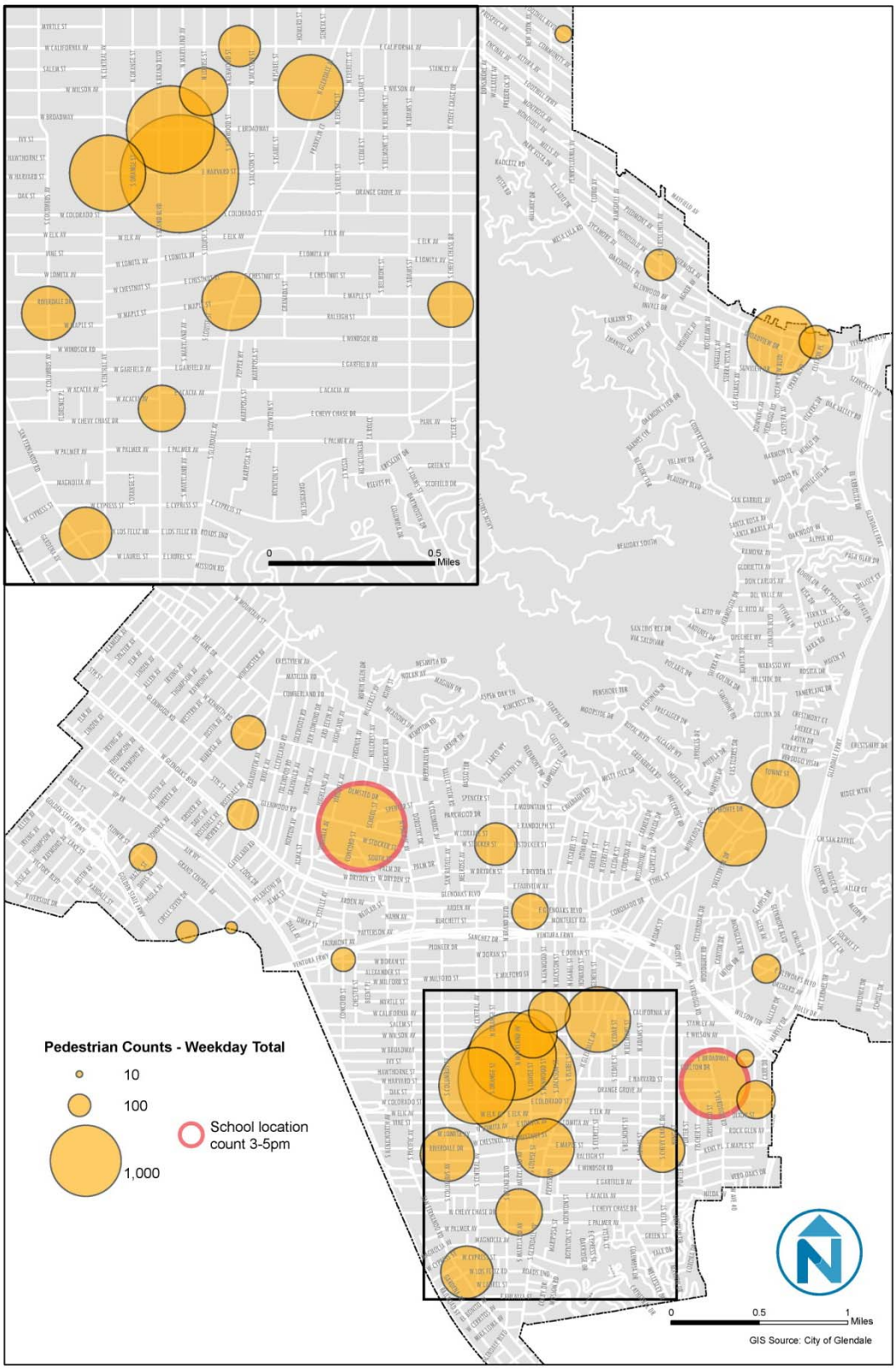
Figure 4-4 Top 5 Intersections by Overall Pedestrian Volumes

Intersection	2009 Rank	2010 Rank	2013 Rank	Total Volume (All Time Periods)*
Brand & Harvard	-	-	1	4,156
Central & Americana Way	-	1	2	3,675
Brand & Broadway	1	2	3	2,237
Honolulu & Oceanview	2	5	4	1,826
Glendale & Wilson	3	3	5	1,166

* Ranks based on overall counts for 2013 including all intersection legs counted and all time periods

Figure 4-5 illustrates combined weekday pedestrian volumes for 2013, including the two locations that were only counted during the school period (3-5 p.m.). While the highest pedestrian volumes are in downtown Glendale, there are also a few isolated locations with high pedestrian activity: near the two schools (Verdugo and Harvard and Concord and Glenwood), Verdugo and Mountain, and Broadview and Oceanview.

Figure 4-5 Map of Count Locations with Pedestrian Volumes, Weekday AM & PM, 2013



Peak-Hour Volumes

Peak-hour volumes represent the sum of the four consecutive 15-minute intervals that capture the highest volumes of bicyclists or pedestrians within a two-hour count period. Peak-hour volumes are useful to analyze because even within a two-hour count period, there can be substantial fluctuation in the number of bicyclists or pedestrians at a given intersection. For example, if a school gets out at 3 p.m., there will invariably be a high level of activity in the first 15-30 minutes in the immediate vicinity of that school. However, by 4:30 p.m. or 5 p.m. most students will have left and bicycle and pedestrian activity will have declined significantly. Peak-hour data isolates when streets are busiest and can be a helpful tool in planning for future improvements or projects.

Figures 4-6 and 4-7 provide a summary of the bicycle and pedestrian peak-hour volumes by both location and count period.

Bicyclists

- The highest peak-hour bicycle volumes in 2013 were observed at Honolulu and Verdugo (85 bicyclists), Honolulu and La Crescenta (66 bicyclists), Honolulu and Oceanview (65 bicyclists), and Flower and Sonora (64 bicyclists).
- All four of these top peak-hour counts occurred during the weekend 10 a.m. – 12 p.m. time period, which was also the case for previous years' highest peak-hour counts. This trend suggests that people in Glendale likely are using bicycles more often for recreation than for commuting, but both types of bicyclists (recreational and utilitarian) are present in Glendale.
- The top weekday peak-hour intersections include:

Intersection	Count	Time Period
Verdugo & Mountain	44	Weekday 5-7 p.m.
Flower & Sonora	35	Weekday 5-7 p.m.
Flower & Sonora	34	Weekday 7-9 a.m.
Brand & Broadway	30	Weekday 5-7 p.m.

- Overall, the weekend peak-hour period observed the highest volume of bicyclists (60% higher than the weekday p.m. peak-hour period), suggesting a propensity for recreational bicycling over regular bicycle commuting. The p.m. peak-hour (weekdays within the 5-7 p.m. period) saw the second highest peak-hour volume (46% higher than the weekdays 7-9 a.m. peak-hour).
- For the two school locations, while the bicycle volume was highest during the first hour of the counting period (3-4 p.m.), each following hour segment saw only a minor decline in bicycle volume.
- In general, the 2013 weekday a.m. count period exhibited an increasing trend in bicycle volumes, whereas the evening p.m. period exhibited a decreasing trend in volumes.

Pedestrians

- The highest peak-hour pedestrian volumes were observed at Central and Americana Way (1,556 pedestrians during the weekend a.m. peak-hour) and at Brand and Harvard (1,098

pedestrians during the weekday p.m. peak-hour and 999 during the weekend a.m. peak-hour). At each of these locations, the weekday a.m. peak-hour was substantially lower in comparison to the weekday p.m. and weekend a.m. peak hours.

- At the two school locations, the first hour of the count period exhibited the highest volume of any hour between 3 p.m. and 5 p.m. However, unlike bicycle volumes, peak-hour pedestrian volumes dropped dramatically as the count period approached 4 p.m. and 5 p.m.

Figure 4-6 (a) Peak-Hour Bicycle Volumes, by Count Period

Intersection	Total (All Time Periods)	Weekday 7-9 AM Peak-hour	Weekday 5-7 PM Peak-hour	Weekend 10 AM - 12 PM Peak-hour	Weekday 3-5 PM Peak-hour
Brand & Broadway	69	19	30	20	
Brand & Chevy Chase	60	18	24	18	
Central & Americana Way*	44	12	26	6	
Central & Stocker	34	8	20	6	
Colorado & Lincoln	56	13	22	21	
Columbus & Riverdale	32	9	15	8	
Concord & Doran*	45	13	20	12	
Concord & Glenwood (HS)	7	n/a	n/a	n/a	7
Flower & Sonora	133	34	35	64	
Foothill & Pennsylvania**	16	8	-	8	
Glendale & Maple	45	10	22	13	
Glendale & Wilson	66	11	28	27	
Glenoaks & Chevy Chase	45	9	10	26	
Glenoaks & Grandview	63	12	15	36	
Glenoaks & Louise	57	7	9	41	
Honolulu & La Crescenta	88	14	8	66	
Honolulu & Oceanview	80	6	9	65	
Honolulu & Verdugo	111	13	13	85	
Jackson & California	16	3	7	6	
Kenneth & Sonora	46	9	5	32	
Louise & Wilson	39	10	16	13	

Intersection	Total (All Time Periods)	Weekday 7-9 AM Peak-hour	Weekday 5-7 PM Peak-hour	Weekend 10 AM - 12 PM Peak-hour	Weekday 3-5 PM Peak-hour
Maple & Chevy Chase	57	11	23	23	
San Fernando & Los Feliz	56	17	13	26	
Verdugo & Harvard (HS)	10	n/a	n/a	n/a	10
Verdugo & Mountain	104	18	44	42	
Verdugo/Canada/Towne	73	21	14	38	
Brand & Harvard	82	26	24	32	
Fairmont & Flower	27	4	14	9	
Glendale Riverwalk Bicycle Path	40	9	18	13	
Broadway & Maynard	11	4	2	5	

*2013 bicycle volumes are missing 5-5:15 p.m. data

**2013 bicycle volumes missing 5-7 p.m. data

Figure 4-6 (b) Peak Hour Bicycle Volumes Bar Chart

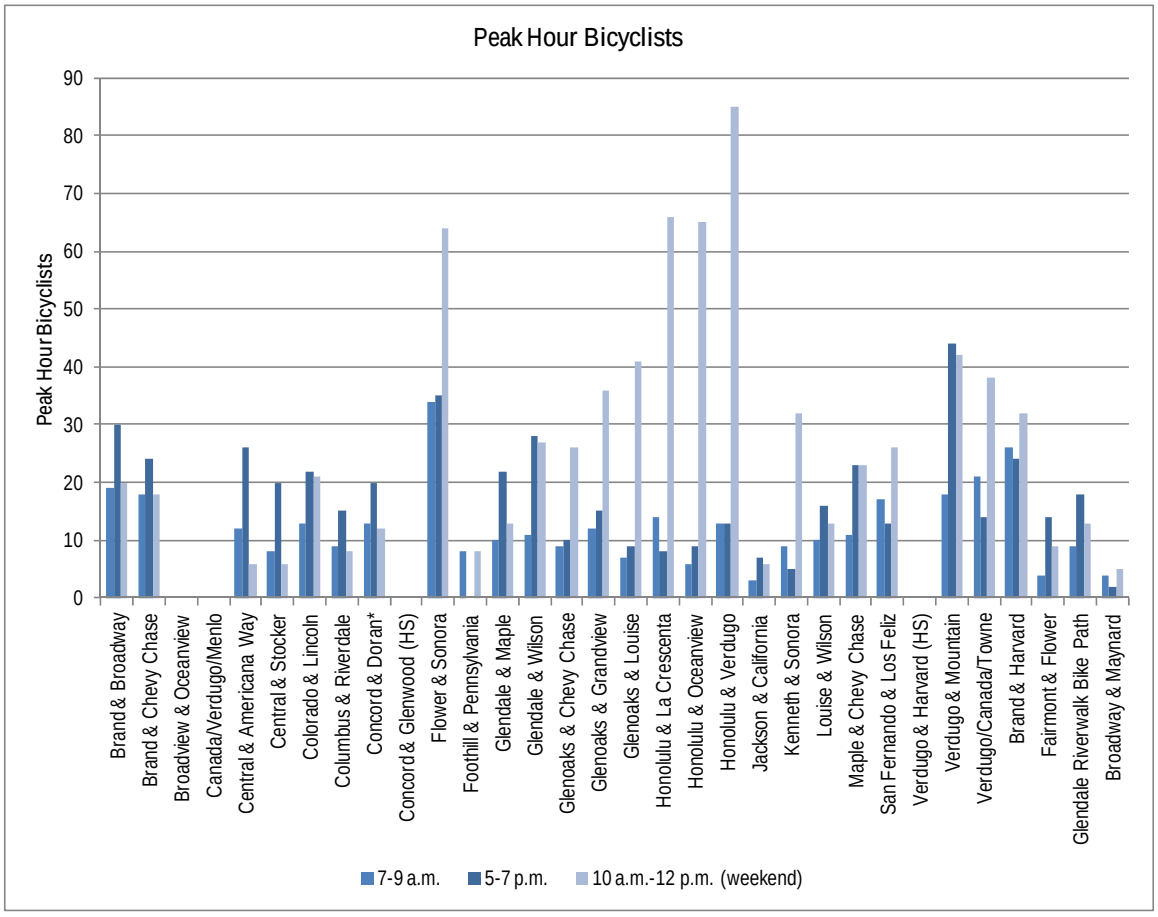


Figure 4-7 (a) Peak-Hour Pedestrian Volumes by Count Period

Intersection	Total (All Time Periods)	Weekday 7-9 AM Peak-hour	Weekday 5-7 PM Peak-hour	Weekend 10 AM - 12 PM Peak-hour	Weekday 3-5 PM Peak-hour
Brand & Broadway	1,236	320	554	362	
Brand & Chevy Chase	387	125	138	124	
Central & Americana Way*	2,255	199	500	1,556	
Central & Stocker	386	136	87	163	
Colorado & Lincoln	211	43	111	57	
Columbus & Riverdale	490	225	143	122	
Concord & Doran*	92	45	27	20	
Concord & Glenwood (HS)	783	n/a	n/a	n/a	783
Flower & Sonora	101	50	37	14	
Foothill & Pennsylvania**	68	34	-	34	
Glendale & Maple	494	187	213	94	
Glendale & Wilson	600	162	276	162	
Glenoaks & Chevy Chase	135	66	30	39	
Glenoaks & Grandview	117	39	45	33	
Glenoaks & Louise***	175	82	74	19	
Honolulu & La Crescenta	138	53	69	16	
Honolulu & Oceanview	1,013	150	385	478	
Honolulu & Verdugo	187	52	68	67	
Jackson & California	237	59	104	74	
Kenneth & Sonora	252	53	98	101	
Louise & Wilson	394	119	138	137	
Maple & Chevy Chase	298	101	122	75	
San Fernando & Los Feliz	404	146	169	89	
Verdugo & Harvard (HS)	717	n/a	n/a	n/a	717
Verdugo & Mountain	531	139	344	48	

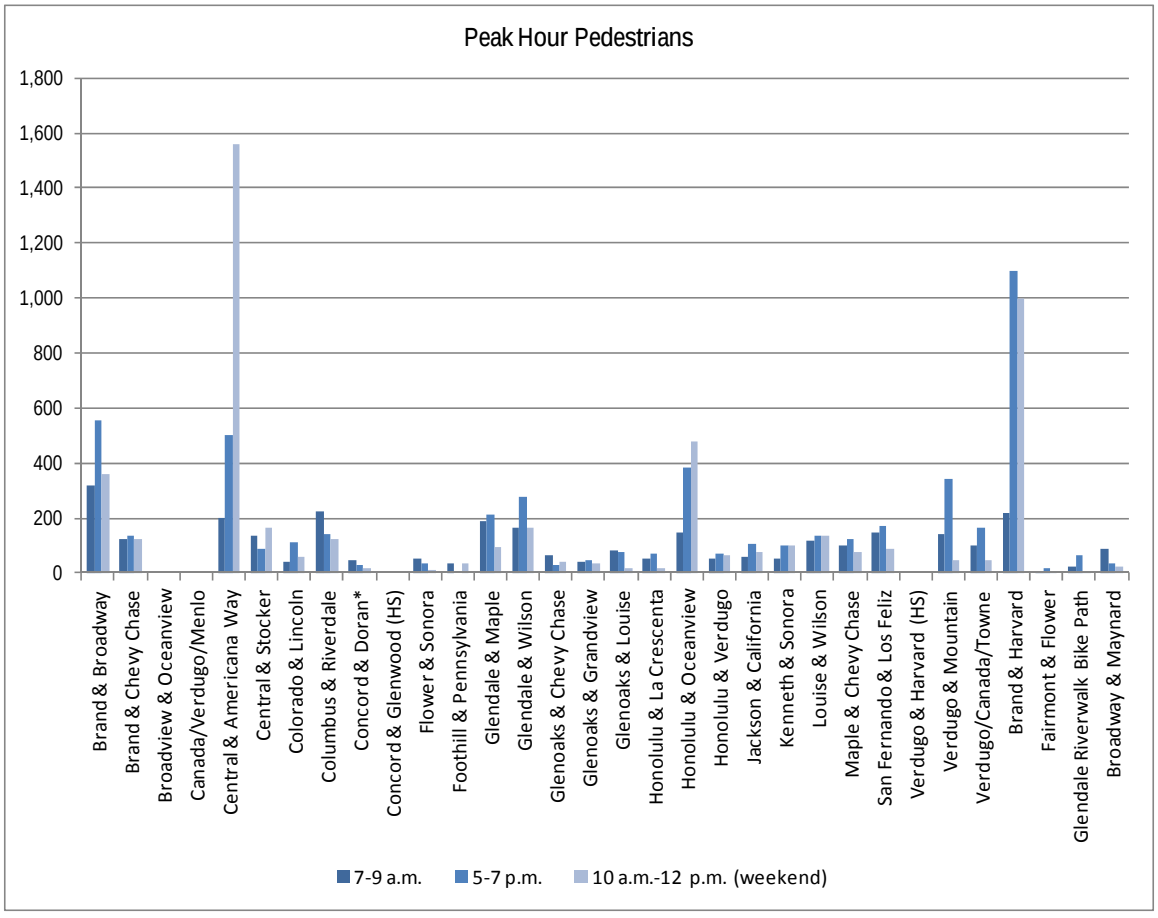
Intersection	Total (All Time Periods)	Weekday 7-9 AM Peak-hour	Weekday 5-7 PM Peak-hour	Weekend 10 AM - 12 PM Peak-hour	Weekday 3-5 PM Peak-hour
Verdugo/Canada/Towne	307	98	163	46	
Brand & Harvard	2,315	218	1,098	999	
Fairmont & Flower	25	8	16	1	
Glendale Riverwalk Bicycle Path	94	24	62	8	
Broadway & Maynard	145	87	37	21	

*2013 ped volumes are missing 5-5:15 p.m. data

**2013 ped volumes missing 5-7 p.m. data

***2013 ped volumes missing weekend 10 a.m. -12 p.m. data for screenline location 785 only

Figure 4-7 (b) Peak Hour Pedestrian Volumes Bar Chart



Weekday vs. Weekend Volumes

Appendix A provides a summary of comparable 2009, 2010, and 2013 bicycle and pedestrian volume data by count period.[9] Complete 2013 volume data, by count period, is provided as Appendix B.

The highest combined overall volumes of bicyclists and pedestrians in 2013 were observed during the weekday p.m. count period, which was also the trend observed in previous years. For pedestrians, this trend holds true—the highest volume period was during the weekday 5-7 p.m. period. However, for bicyclist volumes, the highest volumes were observed on the weekend between 10 a.m. and 12 p.m. While there tends to be a higher propensity for recreational bicycling on weekends, not all weekend riders are doing so recreationally.

Overall pedestrian volumes during the weekend count period were higher than the weekday 7-9 a.m. period, which is a different trend than in 2010. This finding may have been driven by the Brand and Harvard location, adjacent to the Americana, which is expected to have high weekend pedestrian volumes relative to weekday mornings.

[9] Note that these volumes are not complete counts; they represent comparable subsets of the counts in each year, derived using the process described at the beginning of Chapter 3.

Bicyclist Behavior

As Glendale moves forward with improving safety for bicyclists, the counts reinforce the need to pay close attention to certain bicyclist behaviors. In 2009, 2010, and 2013, surveyors noted key bicyclist riding behaviors: wrong-way riding (i.e. riding against the flow of traffic), riding without a helmet, and riding on the sidewalk. These behaviors are illegal in some cases,[10,11] and can endanger bicyclists, pedestrians, and motorists. At the same time, the observation of such behavior can highlight segments of the street network where bicyclists perceive unsafe conditions or where certain safe bicycle facilities may be lacking.

The highest number of wrong-way riders was observed at Glendale and Wilson, Glendale and Maple, and Central and Americana Way. At Glendale and Maple, this could be due to the odd intersection geometry: a marked bicycle route on Maple passes east-to-west, but the east and west legs of the intersection are offset from one another.

Both sidewalk riding and riding without a helmet were most prevalent at two adjacent intersections—Brand and Broadway, and Brand and Harvard.

Figure 4-9 provides a summary of these behaviors overall. While only 5% of observed bicyclists were riding the wrong way on streets, 19% were riding on the sidewalk and 32% without a helmet. These are similar percentages to what was observed in 2010.

Figure 4-8 Observed Bicyclist Behavior, 2013

Year	Total Bikes	Sidewalk Riding		Wrong-Way Riding		No Helmet	
		#	%	#	%	#	%
2013	2,528	487	19%	128	5%	816	32%
2010	2,094	425	21%	63	3%	676	33%

Other Bicyclist and Pedestrian Characteristics

Data on female and child[12] bicyclists and pedestrians, as well as on pedestrians using mobility aids such as wheelchairs, was also collected. Research has demonstrated that the presence of female and child bicyclists can generally serve as an indicator for bicycle-friendly cities,[13] and,

[10] City of Glendale Municipal Code – 10.64.025: "Bicycle riding on sidewalks. No Person shall ride or operate a bicycle upon any public sidewalk in any business district within the city except where such sidewalk is officially designated as part of an established bicycle route. Pedestrians shall have the right-of-way on sidewalks. The prohibition in this section shall not apply to peace officers on bicycle patrol. (Ord. 5116 § 1, 1996)"

[11] California Vehicle Code – 21212(a): "A person under 18 years of age shall not operate a bicycle, a non-motorized scooter, or a skateboard, nor shall they wear in-line or roller skates, nor ride upon a bicycle, a non-motorized scooter, or a skateboard as a passenger, upon a street, bikeway, as defined in Section 890.4 of the Streets and Highways Code, or any other public bicycle path or trail unless that person is wearing a properly fitted and fastened bicycle helmet…"

[12] Defined as a person 12 years of age or under. Surveyors used best judgment to identify child bicyclists and pedestrians.

[13] Baker, L. (2009, October 16). How to Get More Bicyclists on the Road: To boost urban bicycling, figure out what women want. *Scientific American.*

therefore, constitutes an additional benchmark for Glendale as it evaluates its non-motorized planning efforts.

Figure 4-10 provides a summary of this data and some of the key findings are highlighted below:

- Females represent only 10% of all bicyclists observed in 2013. However, females make up approximately 52% of Glendale's overall population.[14] While this is an improvement over 2010 (which recorded 7% of bicyclists as female), females continue to be vastly underrepresented among bicyclists.
- While children represented about 14% of all pedestrians, they only represented about 3% of bicyclists. At school locations, children represented more than three-quarters of all pedestrians. In Glendale overall, approximately 14.3% of the population is 14 years of age or younger.[15]

  Only 2% of all pedestrians were using a wheelchair or other mobility aid, and only 1% was observed using a skateboard, non-motorized scooter, or skates.

Figure 4-9 Summary of Bicyclist and Pedestrian Characteristics, 2013

Year	Total Bikes	Total Peds	Bicycle				Pedestrian					
			Female		Child		Mobility Aid		Skateboard, Scooter, or Skates		Child	
			#	%	#	%	#	%	#	%	#	%
2013	2,528	24,542	263	10%	69	3%	497	2%	317	1%	3,349	14%
2010	2,094	19,696	155	7%	103	5%	98	0.5%	n/a	n/a	1,080	5%

[14] 2008-2012 American Community Survey 5-year Estimates

[15] 2008-2012 American Community Survey 5-year Estimates. Data on 12 and under, which is the definition of "child" used in this count survey, was not available.

5 BICYCLE AND PEDESTRIAN COLLISIONS

This chapter updates data previously reported in the 2010 City of Glendale Bicycle and Pedestrian Count Report. Five years of bicycle and pedestrian collision data was collected from the California Highway Patrol Statewide Integrated Traffic Records System (SWITRS), covering all injury and fatal collisions recorded between 2007 and 2011. California Vehicle Code (CVC) Section 20008 requires that local governments send their police collisions reports to the state.[16]

SWITRS is "living data" as it is constantly updated to add new crashes and edit information previously entered into the database. Therefore, crashes between 2007 and 2009 in this report may differ from what was presented in the 2010 Report. The collisions summarized here use the most current SWITRS data available as of September 2013 (which covers collisions between January 1, 2007 and December 31, 2011).

Additionally, the data in this chapter exclusively represents *reported* collisions that involve *either a fatality or an injury* to a bicyclist or pedestrian (referred to as injury collisions). This excludes collisions that were not reported to the police or that were reported as "property damage only." All collisions are important, but property damage-only collisions (i.e. non-injury collisions) are not reliably reported to police. Even bicycle and pedestrian injury collisions suffer from inconsistent or under-reporting. For example, a bicyclist that crashes without the involvement of a second party may not report that self-involved collision to police. Therefore, documented collision data presented here likely underestimates the number of collisions that occurred between 2007 and 2011 in Glendale.

Finally, it is important to note that collision reporting, especially in terms of determining "fault" in a collision, is based on an officer's best judgment of the circumstances relating to the collision. Common perceptions and biases influence these determinations. Therefore, it is important for cities to continue to work with police departments to incorporate best practices on bicycle and pedestrian risk factors, common accident types, and uphold the rights and responsibilities for all parties.

[16] SWITRS data typically is not made available until at least one year after the end of a given calendar year. At the time of this writing, 2012 data was being added to the database.

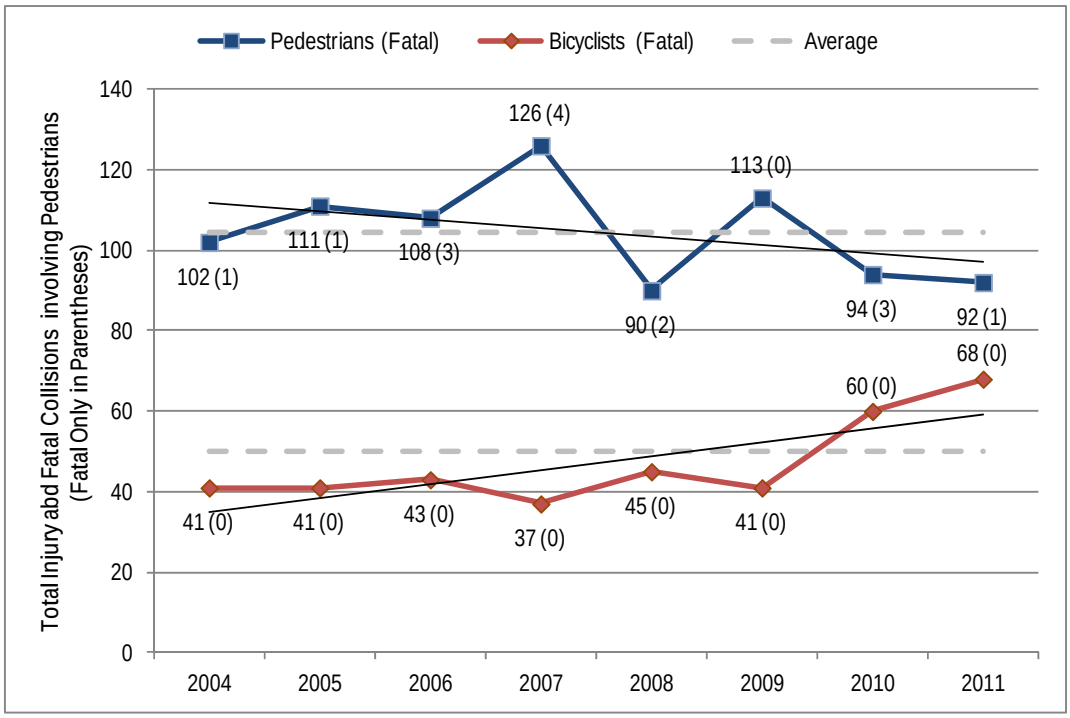
NUMBER OF COLLISIONS

Figure 5-1 shows the number of bicyclist and pedestrian injury collisions in Glendale per year between 2004 and 2011. In that timeframe, Glendale averaged approximately 104 pedestrian injury and 50 bicyclist injury collisions per year.

Over the 2004-2011 time frame, pedestrian injury collisions decreased from a high of 126 (including 4 fatal) in 2007 to 92 (including 1 fatal) in 2011. Again, this is in contrast to bicyclist injury collisions, which nearly doubled from 37 in 2007 to 68 in 2011. No bicyclist fatalities were reported between 2007 and 2011. While not available as SWITRS data, City staff reported six pedestrian fatalities in 2013 and one bicyclist fatality was reported in 2014 (as of April).[17]

It is important to note that SWITRS data are not always accurate in regards to fatal collisions. In cases where a bicyclist or pedestrian initially is injured, but later dies as a result of the accident, SWITRS data are not always updated to reflect the fatality. To ensure accuracy, SWITRS data should be cross-referenced with hospital data.

Figure 5-1 Bicyclist and Pedestrian Injury Collisions, 2004-2011



[17] City of Glendale Community Development Department.

TOP LOCATIONS FOR INJURY COLLISIONS

This section describes both intersections and street segments with the highest numbers of bicycle and pedestrian injury collisions. It should be noted that these locations are not necessarily the "most dangerous" intersections in Glendale for bicyclists and pedestrians—to determine that, one would need to calculate the *rate* of collisions at any given location, taking into account the total number of bicyclists or pedestrians that pass through that location. Intersections with high counts of collisions often represent locations with high volumes of bicyclists or pedestrians, which is not necessarily where a bicyclist or pedestrian has the highest chance of being involved in a collision.

SWITRS classifies collisions according to whether or not they occurred in an intersection. This data was used to create the information mapped in Figures 5-2 and 5-3.[18] For non-intersection collisions, SWITRS provides information on the direction and distance from an intersection. For example, "Wilson Ave east of Isabel St" refers to the half block street segment of Wilson Avenue directly east of Isabel Street. In addition to aggregating the raw data, the collision maps were examined to visually confirm locations.

Figure 5-4 lists locations with the highest number of pedestrian injury collisions, and Figure 5-5 does the same for bicyclist injury collisions. Bicyclist collisions were more likely than pedestrian collisions to occur at intersections. Bicyclist collisions were also less clustered than pedestrian collisions. For pedestrians, several locations were high injury locations during both five-year periods; for bicyclists, there was no clear geographic trend either within the 2007-2011 data or between the current data and 2004-2009 data.

In 2013, bicycle infrastructure improvements were implemented at some of the high collision locations after the latest bicycle count was conducted, which could help address safety issues in the future. The roughly 2.5 mile stretch of Broadway between San Fernando Road and the eastern city limits now includes Class III Bikeway improvements. This roadway segment transverses 11 intersections that had at least one bicycle-involved collision between 2007 and 2011. It also goes through one of the top ten 2013 count locations: Brand and Broadway. Proposed Class III improvements on Cerritos Avenue between Gardena and Glendale Avenues are planned to improve an area adjacent to the intersection of San Fernando and Glendale, another location with higher volumes of collisions.

Class III Bikeways with route signage were also implemented on Honolulu Avenue between Boston and Pennsylvania Avenues, Pennsylvania between North and South Honolulu Avenue, and Honolulu between Pennsylvania and Orangedale. Two intersections along Honolulu Avenue (Honolulu at Whiting Woods Road and Honolulu at Ramsdell Avenue) had bicyclist-involved collisions between 2007 and 2011.

It is important to continue to monitor the location of collisions, as such an analysis highlights "hot spots" where collisions continue to occur or develop over time. Site visits, observations, and a more detailed review of roadway design provide a more complete picture of why collisions occur in a given location.

[18] An interactive map of collisions is available through the University of California, Berkeley's Transportation Injury Mapping System, http://tims.berkeley.edu/.

Figure 5-2 Pedestrian Collisions 2007-2011

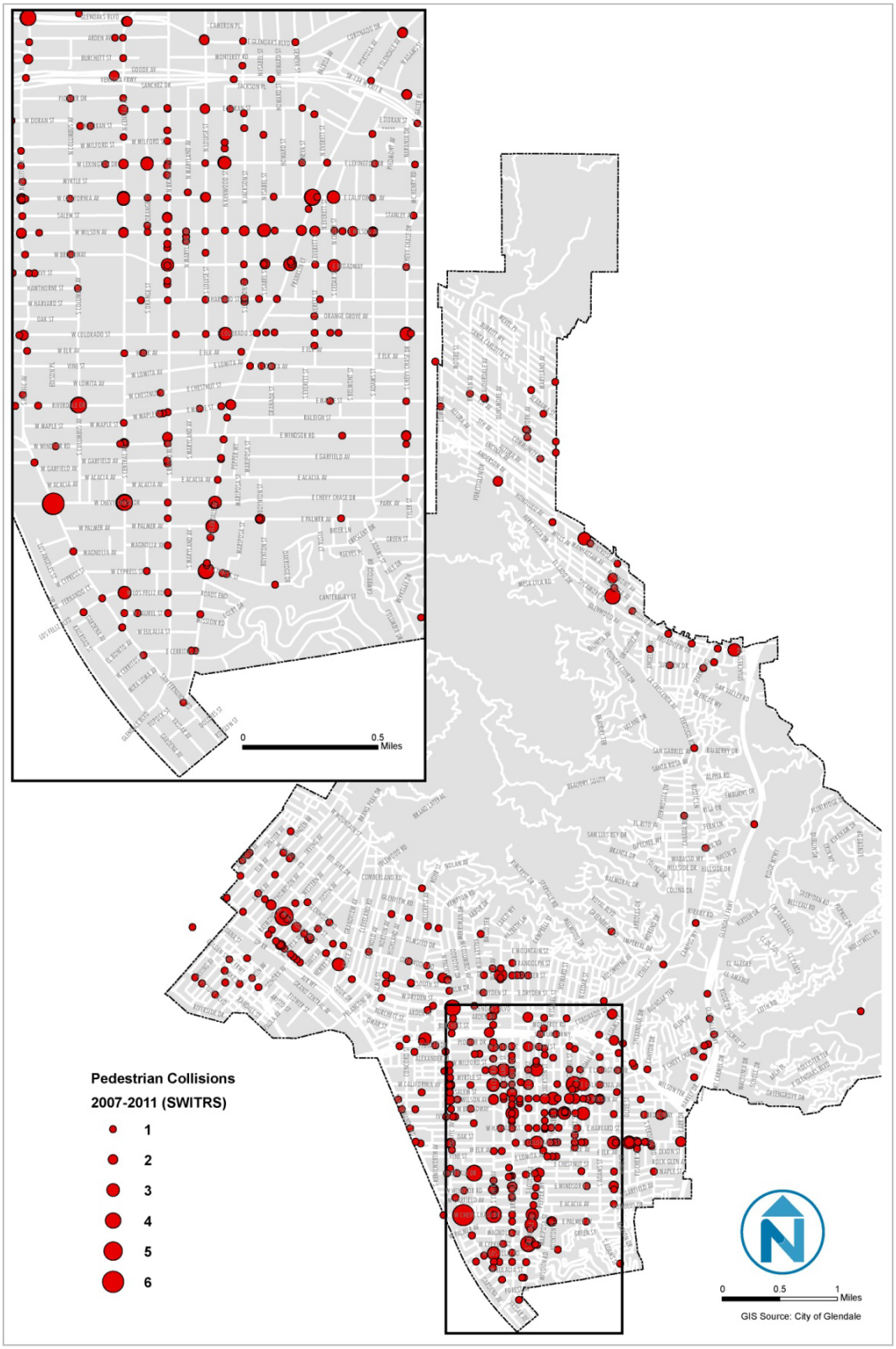


Figure 5-3 Bicycle Collisions, 2007-2011

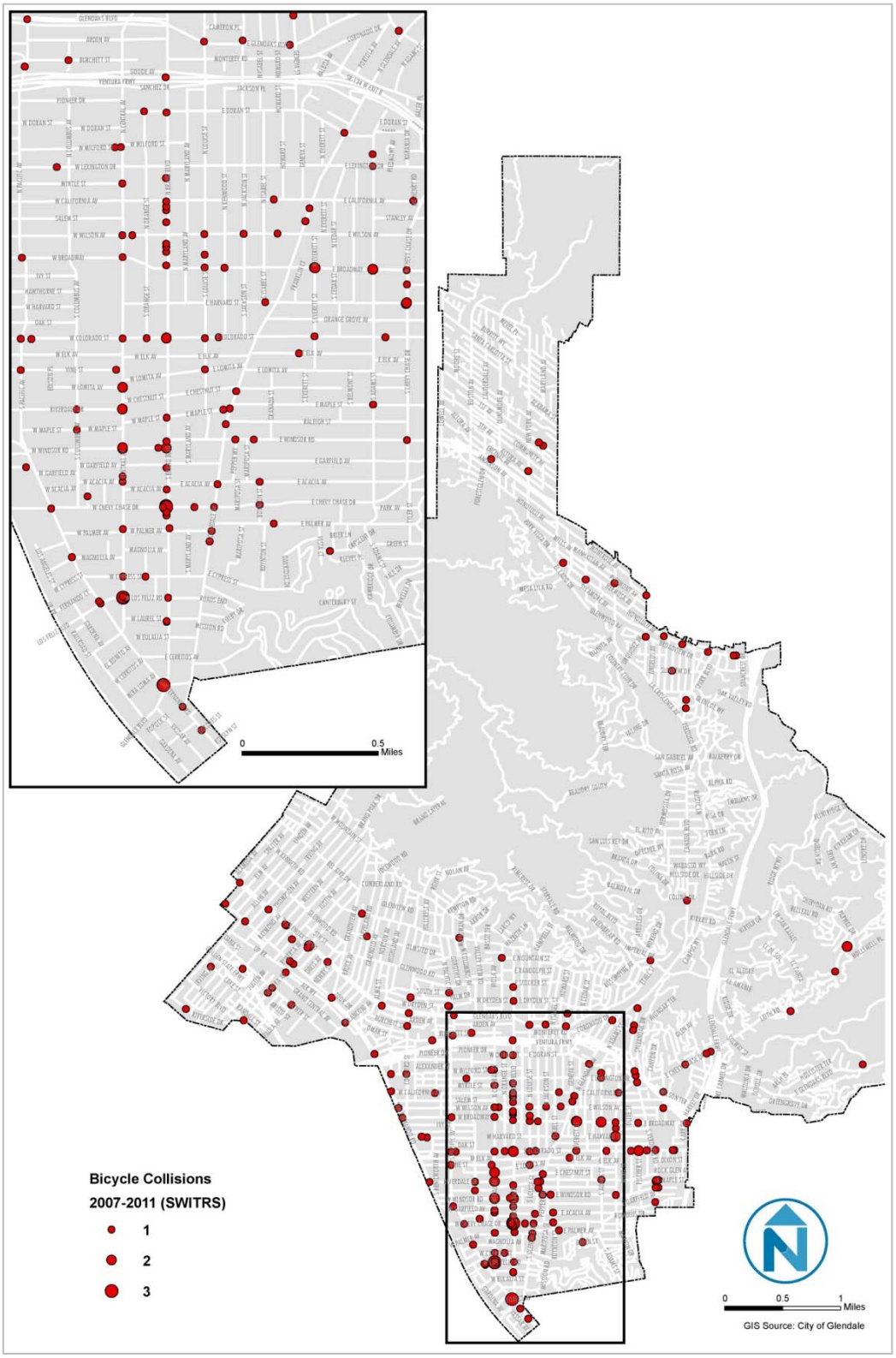


Figure 5-4 Locations with the Highest Number of Pedestrian Injury Collisions, 2007-2011

Location	Pedestrian Collisions
Segment: Glendale Ave north of Cypress St*	6
At intersection: Chevy Chase Dr at San Fernando Rd*	6
Segment: Glenoaks Blvd east of Western Ave*	5
Segment: Glendale Ave north of Broadway	5
Segment: Glenoaks Blvd west of Pacific Ave	4
At intersection: Broadway at Brand Blvd	4
Segment: Wilson Ave east of Isabel St	3
Segment: Colorado St east of Lincoln Ave*	3
At intersection: Glendale Ave at Palmer Ave	3
At intersection: Glenoaks Blvd at Sonora Ave	3
*Also a high-collision location during the 2004-2009 period	

Figure 5-5 Locations with the Highest Number of Bicyclist Injury Collisions, 2007-2011

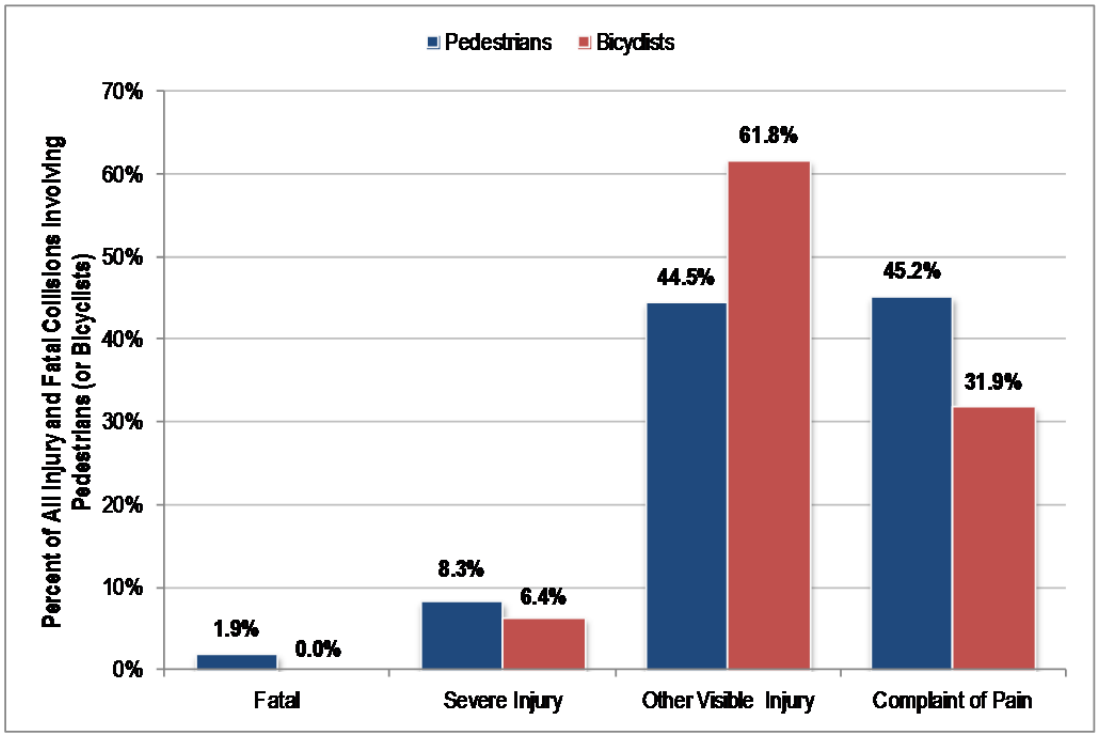
Location	Bicycle Collisions
Segment: Brand Blvd south of California Ave	3
Segment: Central Ave north of Los Feliz Blvd	3
At intersection: Colorado St at Everett St	3
At intersection: Brand Blvd at San Fernando Dr	3
At intersection: Windsor Ave at Brand Blvd	2
At intersection: Colorado St at Brand Blvd	2
At intersection: Chevy Chase Dr at Brand Blvd	2
Segment: Brand Blvd south of E Chevy Chase Dr	2
At intersection: Chevy Chase Dr at Golf Club Dr	2
Segment: Brand Blvd south of Laurel St*	2
Segment: Windsor Rd east of Brand Blvd	2
*Also a high-collision location during the 2004-2009 period	

SEVERITY OF COLLISIONS

SWITRS categorizes injury collisions by severity, with "fatal" being the most severe and "complaint of pain" the least. For both bicyclists and pedestrians, minor injury collisions ("other visible injury" or "complaint of pain") were far more common than severe or fatal collisions between 2007 and 2011. The vast majority of bicyclist injury collisions resulted in a visible injury, whereas pedestrians were equally as likely to experience a visible injury as they were to complain of pain (without visible injury).

Between 2007 and 2011, there were 10 fatal pedestrian collisions (1.9% of the total), but none for bicyclists. Fatal pedestrian collisions represented the same percentage of total collisions between 2007 and 2011 as they did between 2004 and 2009. Figure 5-6 shows collisions for both bicyclists and pedestrians, by severity for 2007 - 2011.

Figure 5-6 Severity of Bicyclist and Pedestrian Collisions, 2007-2011



PRIMARY COLLISION FACTORS

In addition to collision severity, SWITRS classifies each collision according to its primary collision factor (PCF). PCFs are general categories and can be defined as "the one element or driving action which, in the officer's opinion, best describes the primary or main cause of the collision."[19] As discussed in the following section, California Vehicle Code (CVC) violations are also noted for each injury collision and can provide even more detailed information about the cause of a collision.[20] Figure 5-7 highlights the top five PCFs for pedestrian injury collisions in Glendale between 2007 and 2011.

The most common PCF for pedestrian injury collisions was "pedestrian right of way," which typically[21] refers to a situation in which a vehicle violates the right-of-way of a pedestrian (e.g. a pedestrian using a crosswalk). Of these collisions, a motorist was listed at fault about 90% of the time. Collisions with a PCF of "pedestrian right of way" represent a majority (53.4%) of all pedestrian injury collisions recorded in Glendale between 2007 and 2011.

The second most common PCF, representing about a fifth of all pedestrian injury collisions, was "pedestrian violation." This PCF typically refers to a case where a pedestrian violates the right-of-way of another vehicle (e.g. jaywalking). In almost all of these collisions, the pedestrian was listed at fault.

In all pedestrian injury collisions between 2007 and 2011, SWITRS data show that motorists were deemed at fault more commonly (66.2% of the time) than pedestrians. These data sets closely match the trends identified from 2004-2009.

[19] http://www.chp.ca.gov/switrs/pdf/2010-glossary.pdf

[20] It is recommended that the actual police report be reviewed when evaluating any specific collision, as the complete report can provide additional information and useful context.

[21] Note: the SWITRS PCF Violation Category does not specify fault. Fault is recorded separately and can vary within on PCF Violation Category.

Figure 5-7 Top Five PCFs for Pedestrian Injury Collisions by Party at Fault, 2007-2011

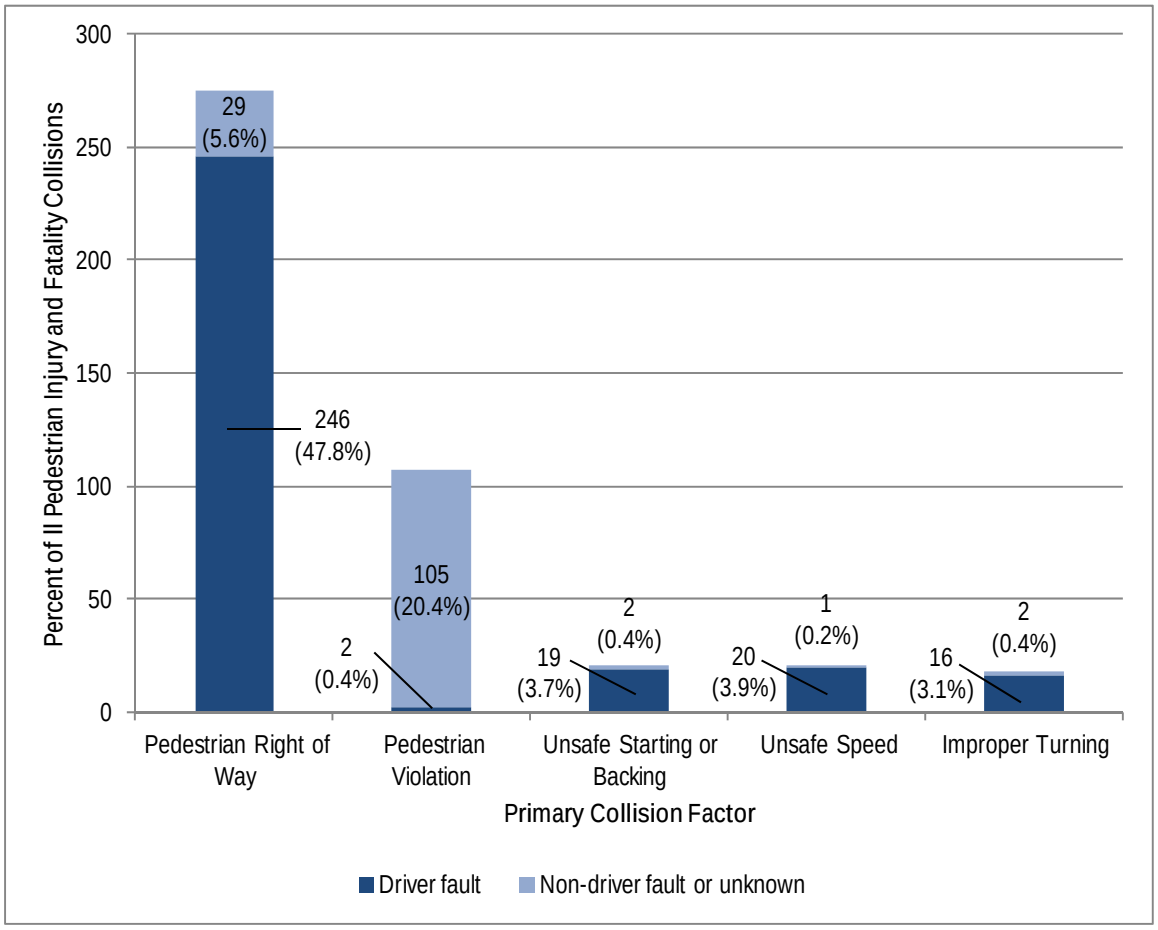
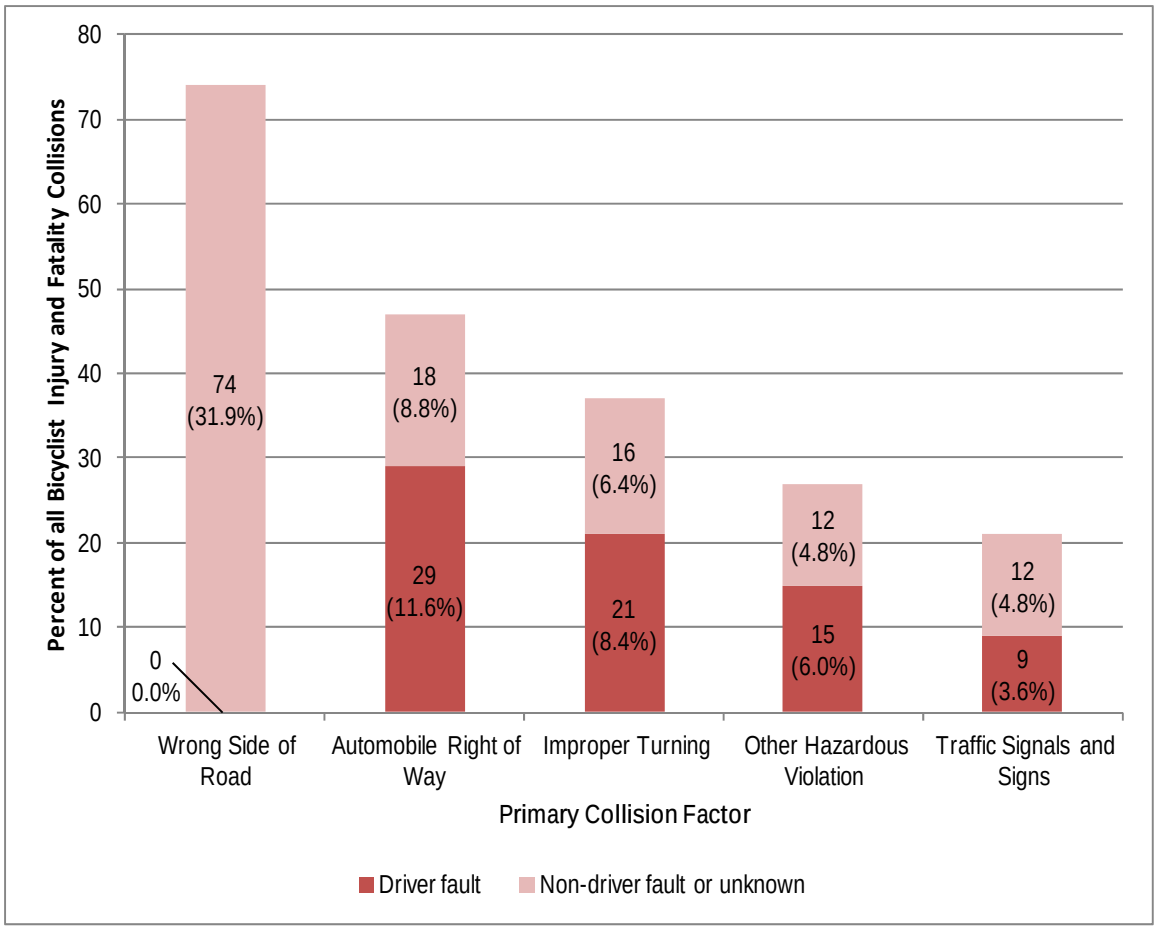


Figure 5-8 highlights the top five PCFs for bicyclist injury collisions in Glendale between 2007 and 2011. Primary collision factors for bicyclist injury collisions are more varied than for pedestrians. The top PCF for bicyclist injury collisions, representing about a third of all collisions, was "wrong side of road"— either a bicyclist or other involved party was traveling on the wrong side of the road. In all 80 "wrong side of the road" collisions, fault was attributed to the bicyclist.

Additionally, just over a fifth of all bicyclist injury collisions had a primary collision factor of "automobile right of way" and in more than half of these collisions, fault was attributed to the motorist. About 15% of all bicyclist injury collisions were the result of "improper turning," which were also recorded as motorist faults in just over half of cases.

In all bicyclist injury collisions between 2007 and 2011, SWITRS data show that motorists were deemed at fault one-third (33.3%) of the time.

Figure 5-8 Top Five PCFs for Bicyclist Injury Collisions, 2007-2011[22]



[22] It is worth noting several bicycle collisions (11 of the 226 addressed in Figure 5-8) were categorized with an unknown at-fault party.

CALIFORNIA VEHICLE CODE (CVC) VIOLATIONS

SWITRS data also includes the CVC violation for each injury collision.[23] Figure 5-9 highlights the top five CVC violations for pedestrian injury collisions between 2007 and 2011. The top CVC violation was 21950.a, which accounted for almost half of all pedestrian injury collision violations. The descriptions for the top five CVC violations are listed below and a complete breakdown of pedestrian injury collisions is provided in Appendix C.

- 21950.a—The driver of a vehicle shall yield the right-of-way to a pedestrian crossing the roadway within any marked crosswalk or within any unmarked crosswalk at an intersection. (Pedestrians were never reported at-fault in pedestrian injury collisions with this CVC violation between 2007 and 2011).
- 21954.a—Every pedestrian upon a roadway at any point other than within a marked crosswalk or within an unmarked crosswalk at an intersection shall yield the right-of-way to all vehicles upon the roadway so near as to constitute an immediate hazard. (Pedestrians were reported at-fault nearly 100% of the time in pedestrian injury collisions with this CVC violation between 2007 and 2011).
- 22106—No person shall start a vehicle stopped, standing, or parked on a highway, nor shall any person back a vehicle on a highway until such movement can be made with reasonable safety. (Pedestrians were never reported at-fault in pedestrian injury collisions with this CVC violation between 2007 and 2011).
- 21952—The driver of any motor vehicle, prior to driving over or upon any sidewalk, shall yield the right-of-way to any pedestrian approaching thereon. (Pedestrians were never reported at-fault in pedestrian injury collisions with this CVC violation between 2007 and 2011).
- 22350—No person shall drive a vehicle upon a highway at a speed greater than is reasonable or prudent having due regard for weather, visibility, the traffic on, and the surface and width of, the highway, and in no event at a speed which endangers the safety of persons or property. (Pedestrians were never reported at-fault in pedestrian injury collisions with this CVC violation between 2007 and 2011).

[23] The 2013 California Vehicle Code can be found at http://www.dmv.ca.gov/pubs/vctop/vc/vctoc.htm

Figure 5-9 Top Five CVC Violations for Pedestrian Injury Collisions, 2007-2011

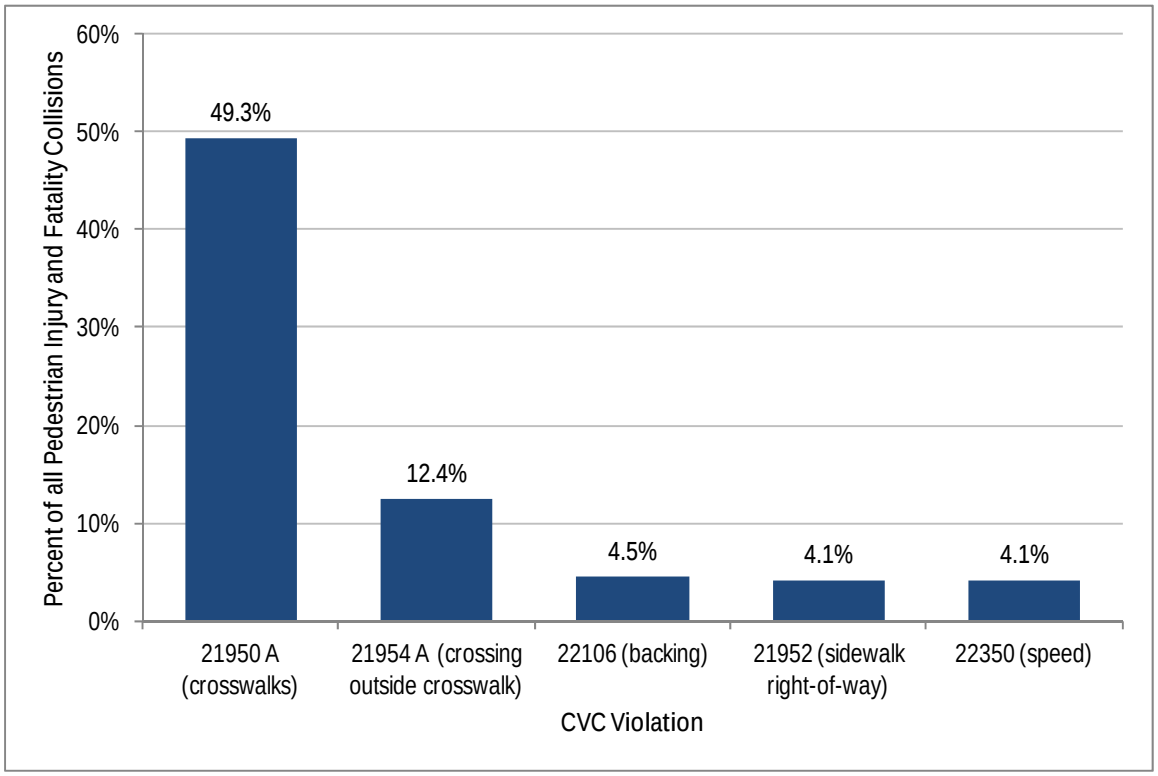


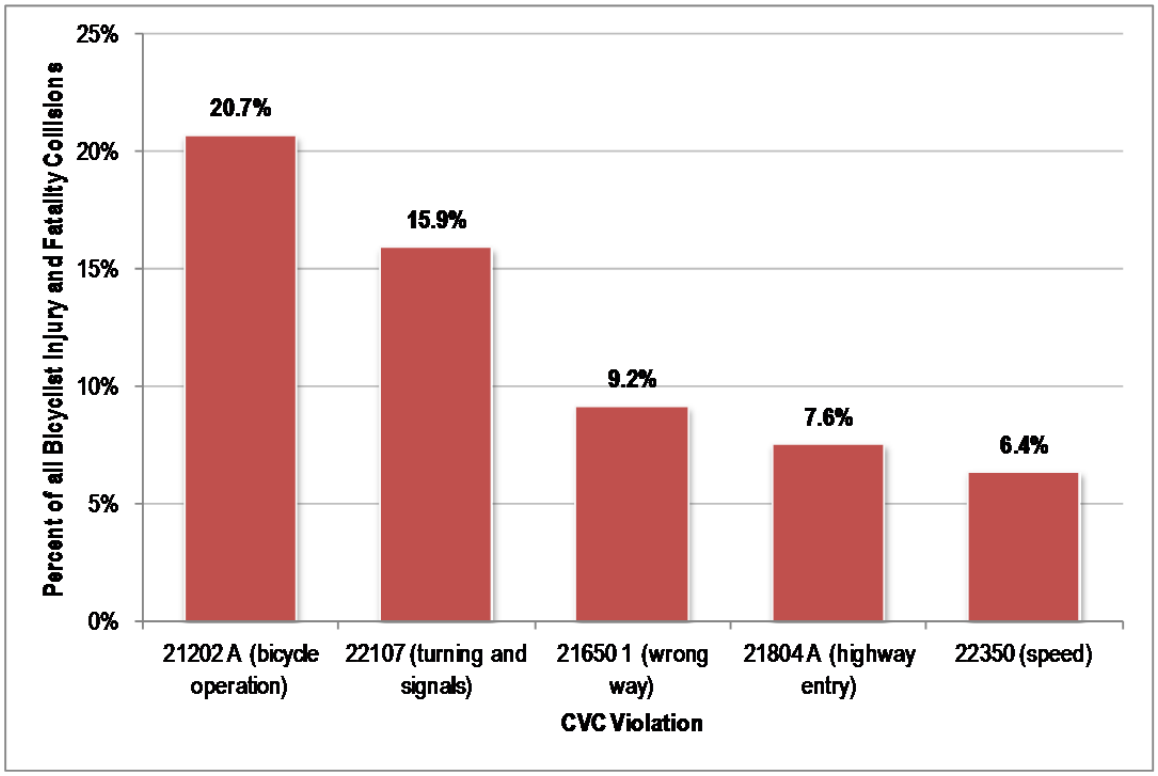
Figure 5-10 summarizes the same data for bicyclist injury collisions between 2007 and 2011. The most common CVC violation resulting in a bicyclist injury collision was 21202.a, representing more than 20% of all bicyclist injury collisions. CVC violations in bicyclist collisions were more diverse than pedestrian collisions, with no single violation type being responsible for a majority of injury collisions. The top five CVC violations for bicyclist injury collisions are as follows:

- 21202.a—Any person operating a bicycle upon a roadway at a speed less than the normal speed of traffic moving in the same direction at that time shall ride as close as practicable to the right-hand curb or edge of the roadway except under certain situations. (Bicyclists were reported at-fault 100% of the time in bicyclist injury collisions with this CVC violation between 2007 and 2011).
- 22107—No person shall turn a vehicle from a direct course or move right or left upon a roadway until such movement can be made with reasonable safety and then only after the giving of an appropriate signal in the manner provided in this chapter in the event any other vehicle may be affected by the movement. (Bicyclists were reported at-fault about 38% of the time in bicyclist injury collisions with this CVC violation between 2007 and 2011).
- 21650.1—Upon all highways, a vehicle shall be driven upon the right half of the roadway, except when overtaking a passing another vehicle proceeding in the same direction under the rules governing that movement. (Bicyclists were reported at-fault 100% of the time in bicyclist injury collisions with this CVC violation between 2007 and 2011).
- 21804.a—The driver of any vehicle about to enter or cross a highway from any public or private property, or from an alley, shall yield the right-of-way to all traffic, as defined in

Section 620, approaching on the highway close enough to constitute an immediate hazard, and shall continue to yield the right-of-way to that traffic until he or she can proceed with reasonable safety. (Bicyclists were reported at-fault about 68% of the time in bicyclist injury collisions with this CVC violation between 2007 and 2011).

- 22350— No person shall drive a vehicle upon a highway at a speed greater than is reasonable or prudent having due regard for weather, visibility, the traffic on, and the surface and width of, the highway, and in no event at a speed which endangers the safety of persons or property. (Bicyclists were reported at-fault about 81% of the time in bicyclist injury collisions with this CVC violation between 2007 and 2011).

Figure 5-10 Top Five CVC Violations for Bicyclist Injury Collisions, 2007-2011



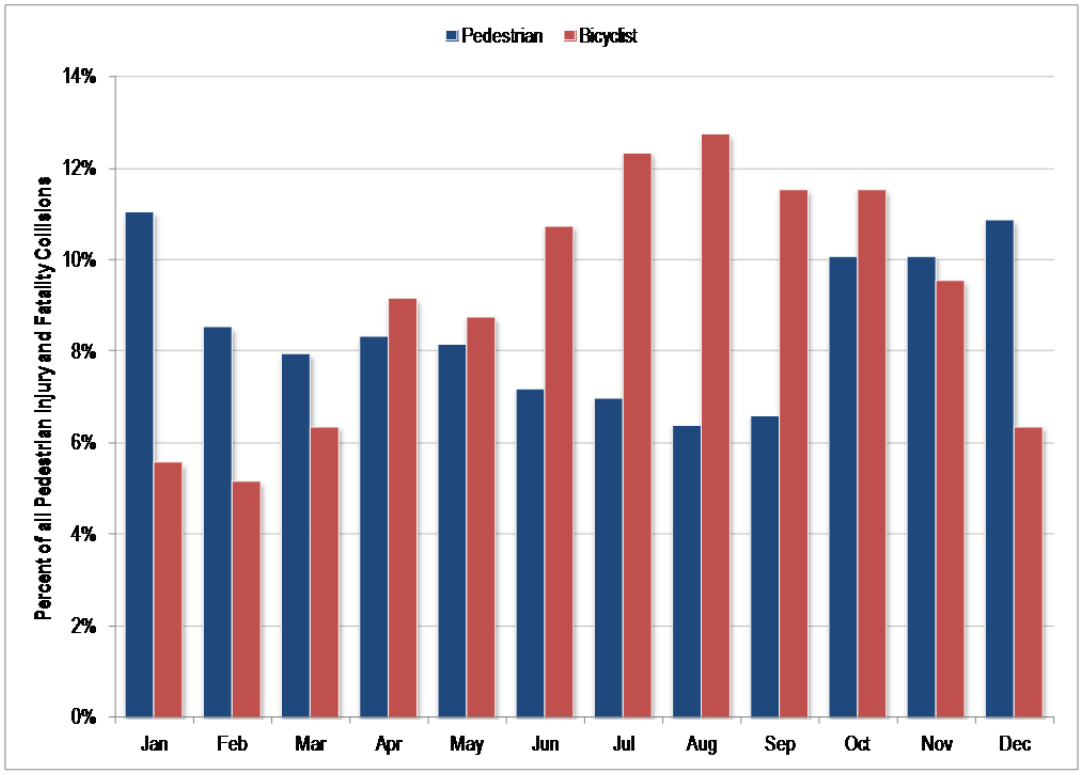
Analyzing PCFs and CVC violations is a useful tool when evaluating injury collisions as this data provides an initial snapshot of motorist, bicyclist, and pedestrian behaviors that are the typical cause for injury collisions. Identifying these behavioral trends is one of the first steps to improving safety for all modes. Furthermore, such data can provide the foundation for public outreach and educational campaigns aimed at addressing common safety violations, as discussed in greater detail in Chapter 7.

MONTH OF THE YEAR

Figure 5-11 shows a breakdown of bicyclist and pedestrian collisions by month. Between 2007 and 2011, most bicyclist collisions happened in late summer or early fall. For pedestrians, injury collisions were more concentrated in the winter months.

Over the course of the year, bicyclist and pedestrian injury collisions followed almost opposite trends. Pedestrian injury collisions decreased almost consistently between January and September, and increased again starting in October. This is in contrast to bicyclist injury collisions, which increased almost consistently starting in January until September.

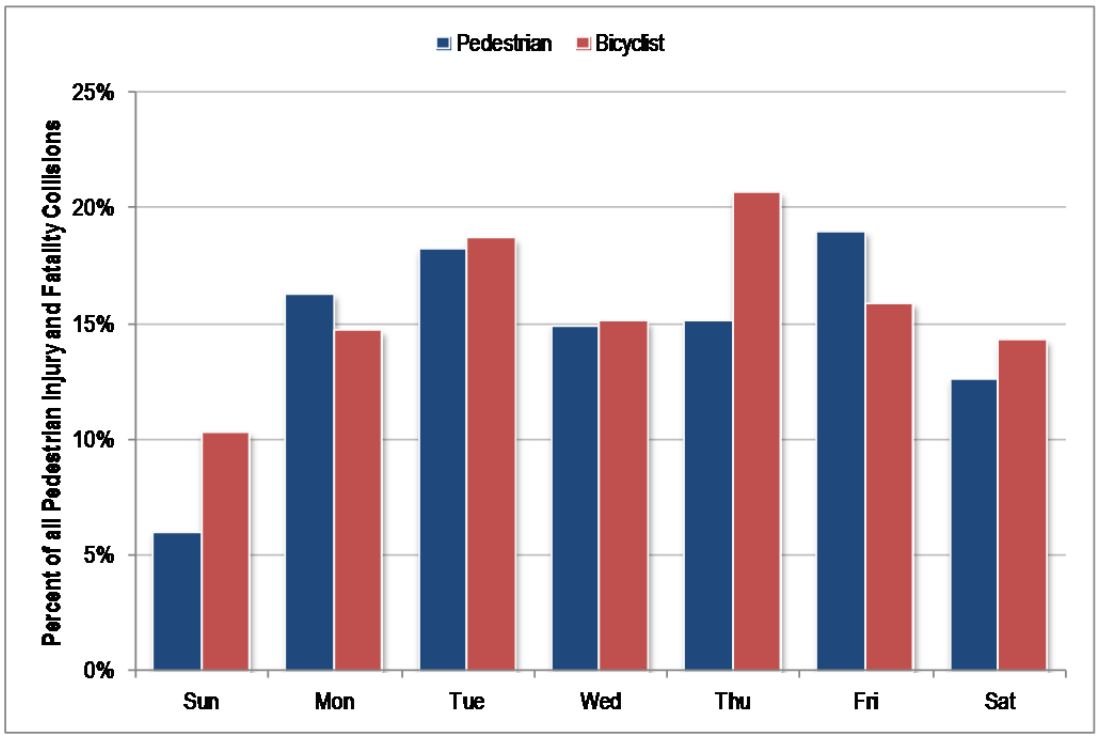
Figure 5-11 Bicyclist and Pedestrian Injury Collisions by Month, 2007-2011



DAY OF THE WEEK

Figure 5-12 summarizes bicyclist and pedestrian injury collisions by day of week. Both types of collisions exhibit a similar trend—collisions were most likely during weekdays, when the majority of people travel. Still, almost a quarter of bicyclist injury collisions and almost a fifth of pedestrian injury collisions occur on weekends. One notable difference between the two groups was that bicyclists were almost twice as likely as pedestrians to be involved in an injury collision on a Sunday.

Figure 5-12 Bicyclist and Pedestrian Injury Collisions by Day of Week, 2007-2011

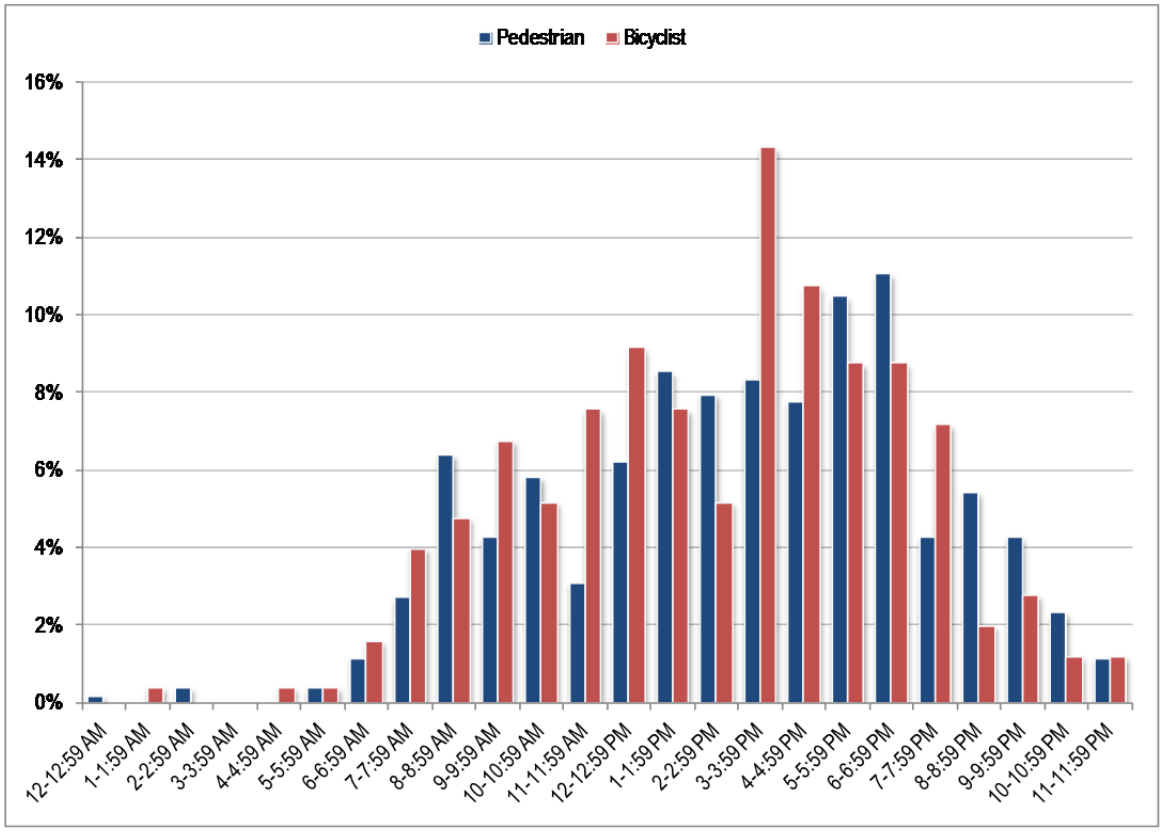


TIME OF DAY

Figure 5-13 shows how bicyclist and pedestrian collisions vary by time of day. Both bicyclists and pedestrian collisions exhibited a sharp increase during the morning commute hour, both of which nearly doubled each hour between 6 a.m. and 9 a.m. Both types of collisions also became more likely as the day progressed; bicyclist injury collisions were most likely between 3 p.m. and 5 p.m. and pedestrians between 5 p.m. and 7 p.m.

Overall, pedestrian collisions were more evenly disbursed throughout the day than bicyclist collisions. After 7 p.m. both bicyclist and pedestrian collisions declined.

Figure 5-13 Bicyclist and Pedestrian Injury Collisions by Time of Day, 2007-2011

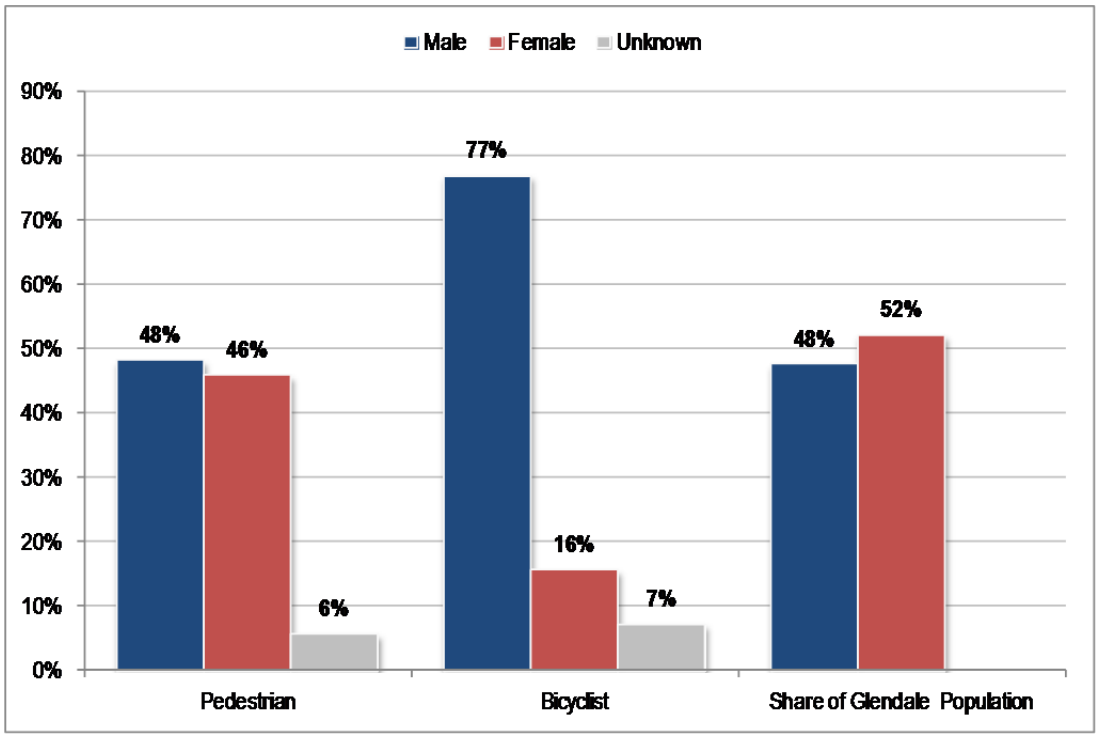


GENDER OF INJURED PARTY

Figure 5-14 shows the percentage of bicyclist and pedestrian injury collisions by gender, and compares those to the overall male/female population of Glendale.[24] Though females were slightly more represented in the Glendale population overall, men were involved in more of the bicyclist injury collisions. Males were almost five times as likely as females to have been involved in an injury or fatal bicycle collision. While other factors may be involved, this trend likely indicates that a much larger share of bicyclists in Glendale is male. Pedestrian collisions closely mirrored the overall population split.

Additionally, data from the September 2013 counts indicate that approximately 10% of bicyclists observed were female, but represented 16% of bicyclist injury collisions between 2007 and 2011. As noted previously, the count methodology does not ensure that the 10% measure is representative of all Glendale bicyclists, and these counts were taken two years after the collision data period, but this difference could suggest that women are disproportionately involved in bicycle injury collisions.

Figure 5-14 Sex of Injured Bicyclists and Pedestrians, 2007-2011



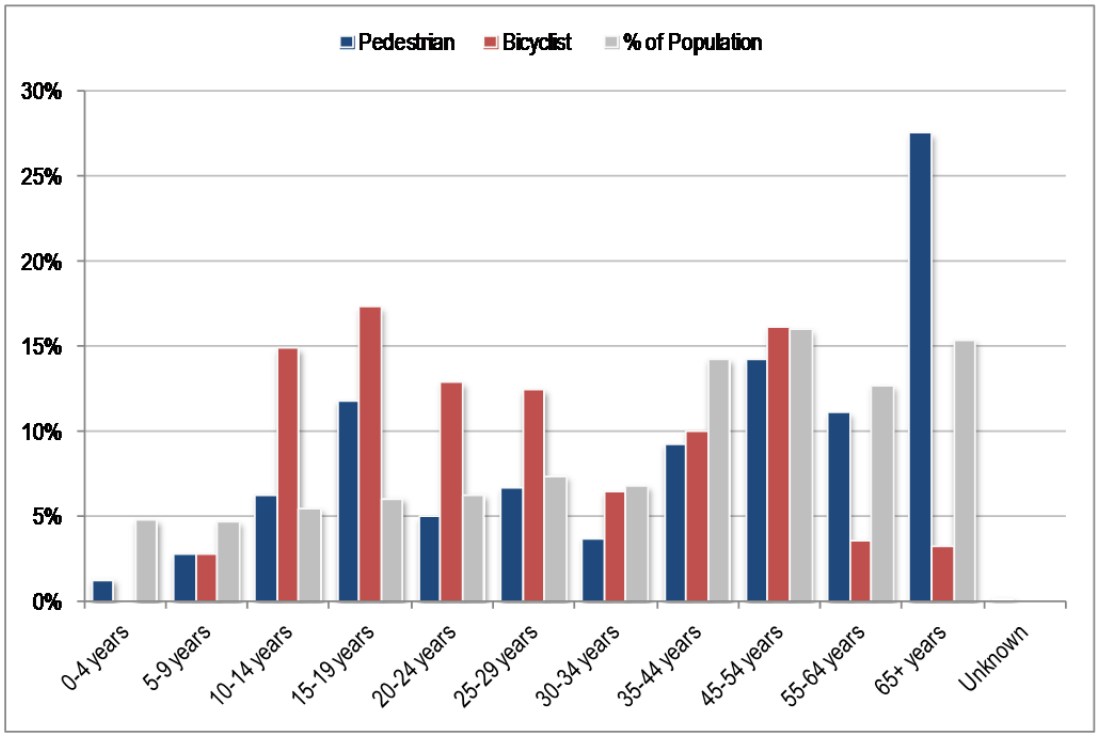
[24] 2010 Census data

AGE OF INJURED PARTY

Figure 5-15 shows the distribution of bicyclist and pedestrian collisions by age, including a comparison to the age distribution in the Glendale population overall. The data show that seniors (aged 65+) were dramatically overrepresented among people involved in pedestrian injury collisions. The same was true for teens (aged 15-19). Generally, young children and middle-aged people were the least likely to have been involved in a pedestrian injury collision (perhaps due to their lower numbers of walking overall), while teenagers and seniors were the most likely.

For bicyclists, injury collisions for people aged 10-29 were two to three times larger than the age group's share of the total Glendale population. Contrary to pedestrian collisions, older adults aged 55 and up did not represent a large share of the bicyclist injury collisions (far less than their share of the overall population). This trend likely indicates lower bicycle ridership among seniors.

Figure 5-15 Age of Injured Bicyclists and Pedestrians, 2007-2011



6 PEER COMPARISON

A peer comparison can provide useful insights into the travel behaviors within different municipalities, while serving as a measure of ongoing evaluation of efforts to make bicycling and walking more desirable modes of travel.

The most useful data set for such comparisons is the U.S. Census and American Community Survey (ACS), which provides "journey to work" data. Journey to work data is not truly representative of how many people are walking or bicycling in a given city because it does not take into account youth or non-commute trips. However, it offers the most consistent and universally available information about travel behavior. In addition, collision data from SWITRS was utilized to generate comparisons between peer cities.

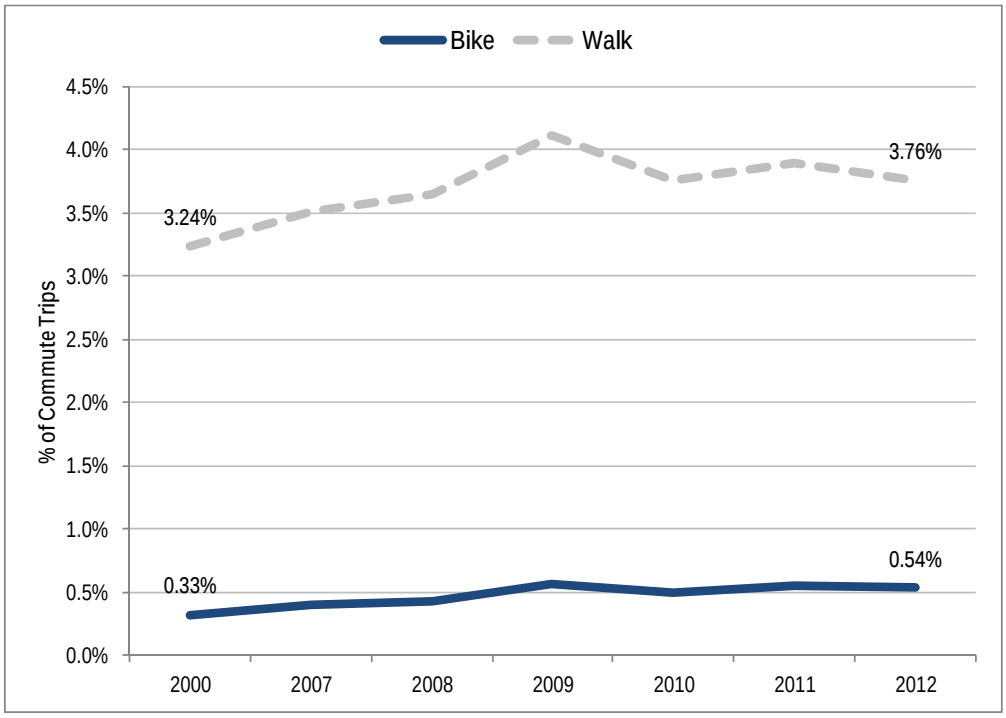
JOURNEY TO WORK

Figure 6-1 shows Glendale's bicycling and walking commute mode share from 2000 to 2012. While bicycling and walking still comprise a very small percentage of commuting in Glendale, both modes have increased from 2000 to 2012. Walking as a commute mode increased from 3.24% in 2000 to 3.76% in 2012, an increase of 16%. Bicycling as a commute mode increased from .33% in 2000 to .54% in 2012, an increase of 65%.

Bicycling and walking as commute modes both peaked in 2009 at .57% and 4.11%, respectively, but have since declined slightly. Since 2010, bicycling and walking commute rates have been relatively steady. It is likely that the severe economic recession and higher gas prices in 2009 contributed to a "spike" in use of more cost-effective modes of travel.

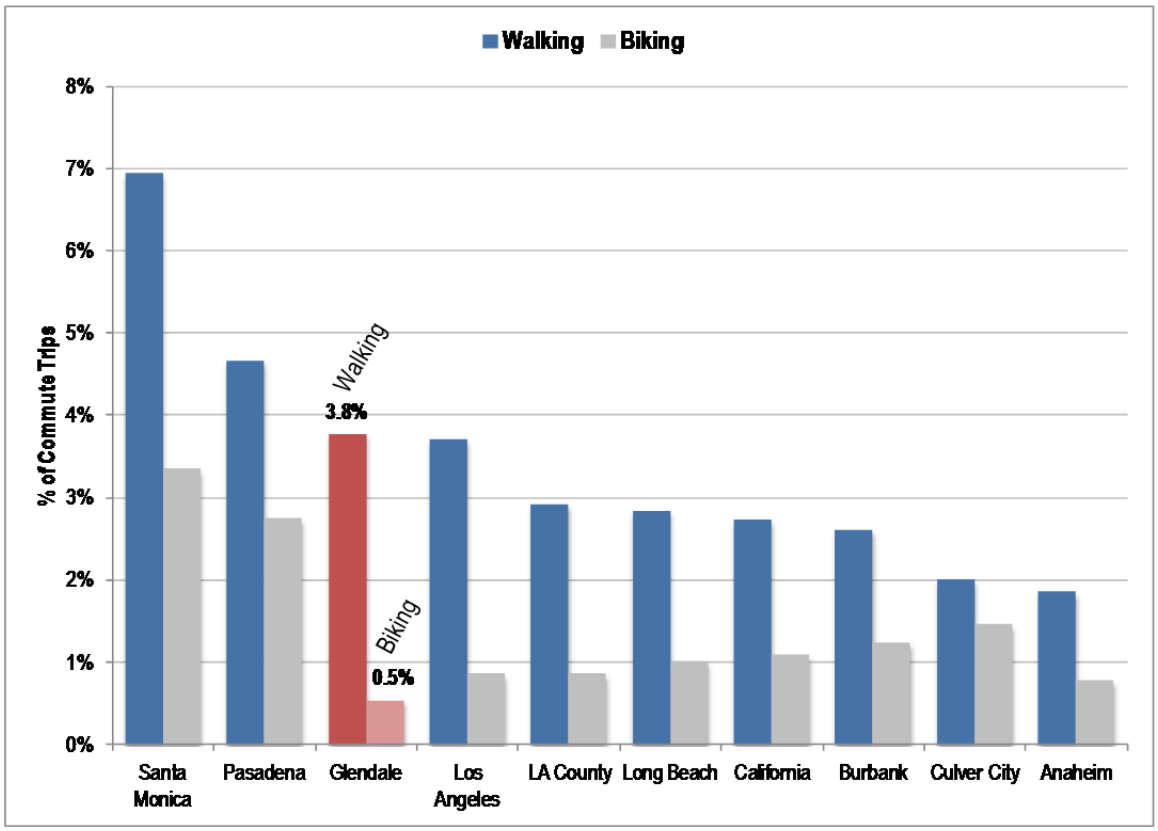
Figure 6-2 shows Glendale's 2012 bicycling and walking commute mode splits in relation to its peer cities. Glendale's 3.8% walking mode share was third highest among selected peers in 2012, yet its bicycle mode share of .54% was the lowest among selected peers.

Figure 6-1 Bicycling and Walking Commute Mode Share, 2000-2012



Source: US Census, 2000; ACS, 5-year estimates

Figure 6-2 Bicycling and Walking Commute Mode Share for Selected Peers, 2012



Source: ACS, 5-year estimates, 2008-12

COLLISIONS PER CAPITA AND TRIPS TO WORK

One of the primary challenges when analyzing collision data is developing an accurate and definitive *collision rate*, as a total number of collisions can be misleading. For example, while injury collisions may have increased in a city, there could also have been a significant increase in the number of people walking over that same time period. What might appear as a dramatic increase in pedestrian collisions, therefore, might not be an actual increase in the overall *rate* of pedestrian collisions.

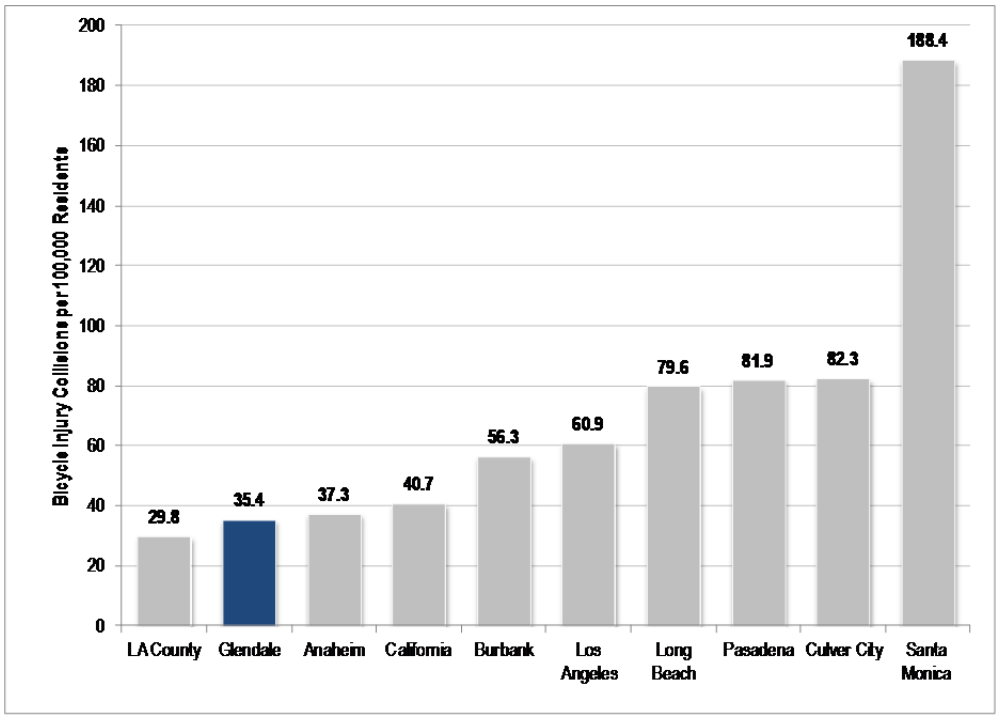
Two limited ways of trying to establish a "collision rate" for bicycles and pedestrians are based on the size of the population, as well as the number of people bicycling or walking to work. This simplified measurement omits the vast numbers and varieties of non-commuting bicyclists or pedestrians, as well as the important differences between street geometries and travel characteristics at specific intersections and road segments. Nevertheless, the number of injury collisions per resident and work trip can serve as an approximate measurement.

Data from 2011 was utilized for comparison purposes between cities. At the time of this report's writing, 2011 was the latest year for which collision data was available for all of the peer cities.

Collisions per Capita

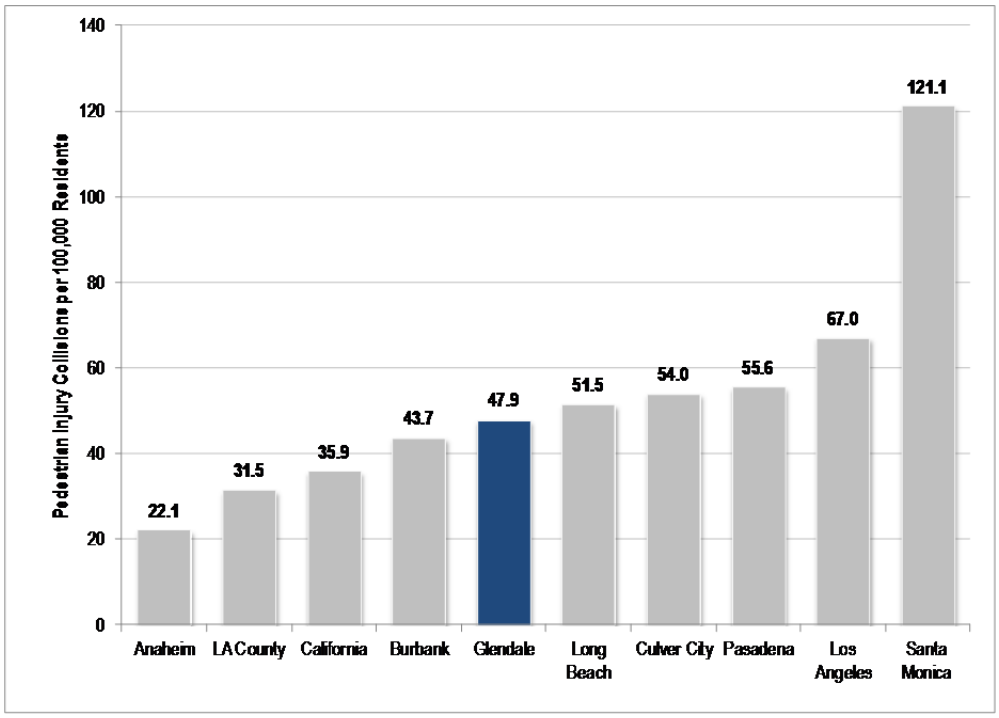
Figures 6-3 and 6-4 highlight Glendale's 2011 per capita bicycle and pedestrian collision rates in relation to selected peers. Glendale has the second lowest bicycle collisions per capita for any of the selected peers at 35 per 100,000 residents, just higher than that of Los Angeles County. Glendale also had approximately 48 pedestrian collisions per 100,000 residents in 2011, which put it near the middle of selected peers.

Figure 6-3 Bicycling Injury Collisions per Capita, 2011



Source: ACS, 5-year estimates; SWITRS

Figure 6-4 Pedestrian Injury Collisions per Capita, 2011



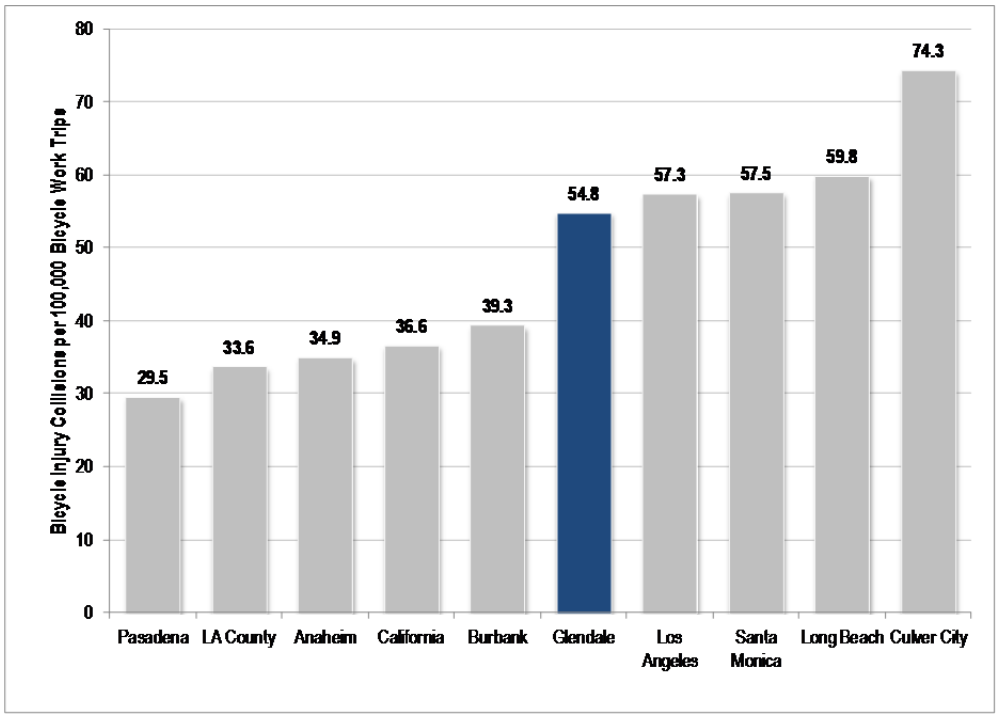
Source: ACS, 5-year estimates; SWITRS

COLLISIONS PER TRIPS TO WORK

Figures 6-5 and 6-6 provide a summary of Glendale's estimated bicycle and pedestrian collisions per 100,000 annual trips to work. This metric seeks to link injury collisions to actual bicyclist and pedestrian volumes in a given city. Once again, journey to work data, although it underestimates actual bicycling and walking volumes, is the best available data to utilize, especially when seeking to compare data across multiple peers.

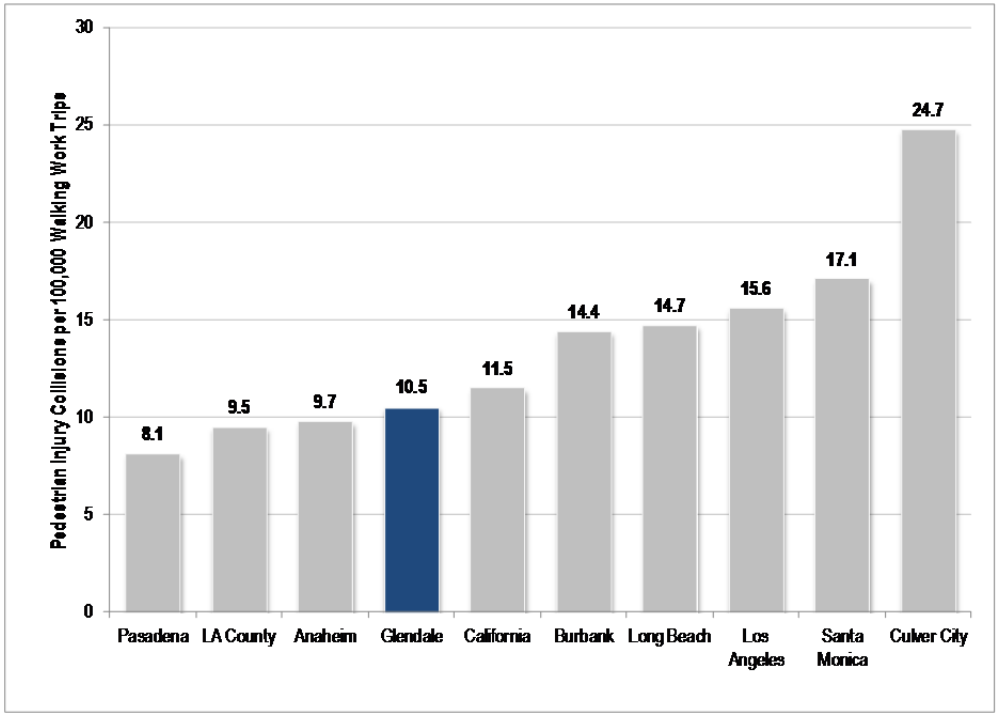
In 2011, Glendale had almost 54 bicycle injury collisions and 11 pedestrian injury collisions per 100,000 annual work trips. Among the selected areas, Glendale is sixth out of ten for bicycle collisions per 100,000 annual bicycle trips to work, and fourth of ten for pedestrian collisions per 100,000 annual walking trips to work.

Figure 6-5 Bicycle Injury Collisions per Annual Trips to Work, 2011



Source: ACS, 5-year estimates; SWITRS

Figure 6-6 Pedestrian Injury Collisions per Annual Trips to Work, 2011



Source: ACS, 5-year estimates; SWITRS

7 RECOMMENDATIONS

Outlined below are recommendations for the City of Glendale and Walk Bike Glendale to consider in regards to future count efforts and how to better utilize the data presented in this report. While the City of Glendale and Walk Bike Glendale have made tremendous efforts to improve available bicycle and pedestrian data, there are areas in which potential improvements can be made.

Of course, all of these recommendations must be evaluated and prioritized in the context of limited resources. Nevertheless, this section is intended to give stakeholders additional ideas about ways in which they can continue to plan for additional bicyclists and pedestrians on city streets and ensure safety for these modes.

Conduct the bicycle and pedestrian counts at least every other year.

- Continue to conduct bicycle and pedestrian counts and collisions at least every other year, but preferably annually. A comprehensive analysis of the collected data should be also performed every two years.
- Use the same methodology, count locations, and count time periods in future counts. To draw meaningful conclusions about trends in bicycle and pedestrian activity over the course of several years, it is imperative that count locations and times remain constant to enable longitudinal comparisons. The trends observed will provide valuable feedback on the success of implemented bicycle and pedestrian improvements and can highlight ideal locations for new projects.
- Ensure high count locations are staffed appropriately and with "click-counters." Especially for pedestrian counts, many locations observed very high overall volumes (in some cases, over 1,000 pedestrians passed in a 2-hour period). To ensure accuracy at these locations, additional staff may be needed; one person could be assigned to count pedestrians passing the screenline in a single direction. In addition to regular volunteers, local college students, members of citizen advisory committees, and City interns are a good source for staffing. Each surveyor should use a "click-counter," which helps automate the counting process.
- Continue to provide ample training opportunities for volunteer staff. In addition to printed materials, volunteer surveyors should be trained in-person or over the web in a way that allows for interactions and a question-and-answer period. Given the number of volunteers the counting effort requires, it is useful to provide multiple training opportunities a week or two in advance of the counting period.

Evaluate the purchase of automatic counters in the context of limited resources.

- Recent advancements in technology have allowed for bicycles and/or pedestrians to be counted automatically. Automatic counters allow for long-term counts, can identify variations throughout a designated time period, and require less person hours. Counters can also have a "marketing" effect, as they can be utilized to display real-time activity trends at high-volume

locations.[25] However, automatic counters require a significant upfront capital investment and ongoing operations costs, and do not indicate gender or other behaviors that can be identified with manual counts. In addition, most counters have an error rate, which varies depending on the technology and conditions at the count location. Finally, analysis and interpretation of count data also requires additional staff resources.

It is recommended that the City further evaluate the latest technologies and request price quotes from various vendors to assess the feasibility of such an investment. If the City moves forward, automatic count data should be used to supplement manual counts, as it is unlikely that enough counters could be purchased to fully replace the manual counts. The National Bicycle and Pedestrian Documentation Project provides an overview of counting equipment and vendors.[26]

Utilize count and collision data to prioritize implementation of the Bicycle Transportation Plan, bicycle and pedestrian programs, educational programs focused on improving safety for all modes, and other policies.

- In the immediate term, the City of Glendale has prioritized the implementation of sharrows and bicycle lanes "as long as there are no impacts to the lane geometry of streets and on-street parking and they are not on streets that will be resurfaced within the fiscal year."[27] Bicycle count and collision data can further refine these locations—high volume and/or high collision areas could be the best places for the first investments.
- Use the bicyclist and pedestrian characteristics as evidence for increased programming and encouragement focused on children and women. According to the count data, both women and children are drastically underrepresented among bicyclists in Glendale, and riding without a helmet is still a prominent behavior. Working with schools, local advocates, and other groups could help encourage women and children to bicycle more, and everyone to use a helmet.
- Women are also potentially overrepresented in bicyclist injury collisions. There may be a need for targeted outreach and bicycle safety education for female bicyclists. For example, the San Francisco Bicycle Coalition and the Boston Bike program each offer workshops specifically for women.[28]
- In addition to education targeted at children and women, pedestrian safety education and outreach to seniors could also be prioritized. People aged 65 and older in Glendale were especially overrepresented in pedestrian injury collisions. The National Highway Traffic Safety Administration (NHTSA) has an "Everyone is a Pedestrian" initiative with resources on this topic.[29]Refer to the count and collision database during development project review. These sets of data will help inform expected impacts, and potential mitigations from a proposed development.

  In the future, if bicycle and pedestrian counts are performed on three consecutive days, these data sets can be used to extrapolate an estimate of monthly and annual volume data.

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[25] San Francisco's Market Street Bike Counter: http://totem-eb-market.sanfrancisco.visio-tools.com/

[26] http://bikepeddocumentation.org/downloads/

[27] As stated on the City of Glendale website:www.glendaleca.gov/government/city-departments/public-works/bicycle-master-plan-update#bmpu

[28] See http://www.sfbike.org/?women and http://www.bostonbikes.org/programs/womens-cycling-initiative/

[29] http://www.nhtsa.gov/nhtsa/everyoneisapedestrian/index.html

Combining this with collision data by intersection, one can calculate a collision *rate*. Ranking collision rates by intersection (for the intersections with count data) provides a method for prioritization further safety planning. Those intersections with the highest collision rates could be examined more closely for specific geometric design needs.

- Work with the Glendale Police Department to train officers in local and state laws regarding bicycle and pedestrian travel and ensure that local law enforcement is trained in best practices regarding enforcement, accident investigation, and accident reporting. As one example, the San Francisco Bicycle Coalition recently partnered with the San Francisco Police Department to develop a new curriculum on bicyclists' legal rights and common bicycling situations that police officers will encounter.[30]
- Similarly, the collision analysis in this and future reports can be used to identify needs for targeted enforcement. For example, motorists were consistently at fault for violating the pedestrian right-of-way in crosswalks. Targeted enforcement by Glendale Police Department of illegal behaviors by all road users can help to reduce injury collisions.

Utilize count and collision data to secure additional funding.

- The data gathered in 2013, and presented in this report, offers the City a wealth of new information regarding bicycle and pedestrian behavior in the Glendale. As the City pursues additional sources to fund new infrastructure and safety and educational campaigns, this data should be used to target priority funding needs and enhance applications. Potential funding programs are outlined below. Securing funding from these sources will likely require collaboration with regional agencies, including Metro and SCAG, which actually administer many of these funds and/or coordinate regional funding applications.
  - Transportation Enhancements[31]
  - Recreational Trails Program[32]
  - Bicycle Transportation Account[33]
  - Safe Routes to School Program[34]
  - Active Transportation Program[35, 36]
  - California Office of Traffic Safety grants[37]
  - Environmental Justice (EJ) and Community-Based Transportation Planning (CBTP) grant programs[38]
  - Transportation Planning Grant Program[39]
  - Transportation Development Act (TDA) Article 3 (SB 821)[40]

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30 http://www.sfbike.org/?bikelaw_sfpd_video

31 http://www.fhwa.dot.gov/environment/transportation_enhancements/

32 https://www.fhwa.dot.gov/environment/recreational_trails/

33 http://www.dot.ca.gov/hq/LocalPrograms/bta/btawebPage.htm

34 http://www.dot.ca.gov/hq/LocalPrograms/saferoutes/saferoutes.htm

35 http://www.dot.ca.gov/hq/LocalPrograms/atp/

36 http://www.scag.ca.gov/programs/Pages/ActiveTransportationFunding.aspx?opentab=8

37 http://www.ots.ca.gov/

38 http://www.dot.ca.gov/hq/tpp/offices/ocp/cbtp.html

39 http://www.dot.ca.gov/hq/tpp/grants.html

40 http://www.dot.ca.gov/hq/MassTrans/State-TDA.html

– Metro Call for Projects[41]

Supplement counts and collisions data with other local, regional, and national data sources and continue to participate in the SCAG/Metro Bike Count Data Clearinghouse.

- While the bicycle and pedestrian count data is the primary focus of this study, additional data should continue to be analyzed and integrated. American Community Survey data provides a statistically representative overview of bicycle and walking as commute modes. SWITRS data provides a comprehensive look at bicycle and pedestrian collision data. Other potential data sources include: National Household Travel Survey (NHTS), Bike to Work surveys, surveys of bicyclists and pedestrians, and Air Quality Management District (AQMD) employer commute data.
- Refer to peer cities' bicycling and walking statistics as a benchmark for success. The new Bicycle Clearinghouse, funded by SCAG and LACMTA in partnership with UCLA, offers a unique opportunity to assess Glendale behavior in the context of its regional peers.

Utilize regional data from the Bike Count Data Clearinghouse to create a model of bicycling and walking that can be applied citywide.

- The SCAG/Metro Bike Count Data Clearinghouse website hosts a white paper on Bike Counts, Travel Demand Modeling, and Benefits Estimation.[42] All collected regional data can be downloaded. After a few years' worth of data have been collected, a model could be developed using bicyclist and pedestrian volumes, land use data, demographics information, street classification, or other publicly available data. This model can be used to predict and prioritize locations for future bicycle and pedestrian improvements.

Communicate and advertise the measured increase in bicycling to encourage more of that behavior.

- The 2013 volume data demonstrated a marked increase in bicycling in Glendale since 2010. This increase should be celebrated and communicated. Doing so will continue to normalize bicycling as a common behavior, which can help encourage people who are interested, but who currently bicycle little or not all, to try.

[41] http://www.metro.net/projects/call_projects/

[42] http://www.bikecounts.luskin.ucla.edu/

Appendix A

Combined Bicycle and Pedestrian Volumes, by Count Period (total, weekday 7-9 AM, and weekday 5-7 PM): 2009, 2010, and 2013 Comparison

Location	Total Comparable Data (All Time Periods)												Weekday 7-9 AM (Comparable Data)												Weekday 5-7 PM (Comparable Data)											
	Bicyclists				Pedestrians				Combined				Bicycle				Ped				Overall				Bicycle				Ped				Overall			
Intersection	2009	2010	2013	% change	2009	2010	2013	% change	2009	2010	2013	% change	2009	2010	2013	% change	2009	2010	2013	% change	2009	2010	2013	% change	2009	2010	2013	% change	2009	2010	2013	% change	2009	2010	2013	% change
Brand & Broadway	41	58	62	7%	1,368	1,397	1,082	-23%	1,409	1,455	1,144	-21%	9	9	18	100%	355	353	305	-14%	364	362	323	-11%	18	32	24	-25%	588	587	471	-20%	606	619	495	-20%
Brand & Chevy Chase	60	40	46	15%	481	337	333	-1%	541	377	379	1%	11	13	11	-15%	174	140	106	-24%	185	153	117	-24%	21	13	22	69%	167	110	125	14%	188	123	147	20%
Broadview & Oceanview	9	n/a	n/a	-	211	n/a	n/a	-	220	n/a	n/a	-	2	n/a	n/a	-	66	n/a	n/a	-	68	n/a	n/a	-	3	n/a	n/a	-	76	n/a	n/a	-	79	n/a	n/a	-
Canada/Verdugo/Menlo	56	59	n/a	-	44	82	n/a	-	100	141	n/a	-	7	9	n/a	-	14	50	n/a	-	21	59	n/a	-	10	11	n/a	-	18	27	n/a	-	28	38	n/a	-
Central & Americana Way*	n/a	35	36	3%	n/a	1,725	1,705	-1%	n/a	1,760	1,741	-1%	n/a	1	7	600%	n/a	101	183	81%	n/a	102	190	86%	n/a	26	22	-15%	n/a	732	413	-44%	n/a	758	435	-43%
Central & Stocker	13	5	32	540%	447	457	352	-23%	460	462	384	-17%	2	1	7	600%	112	89	115	29%	114	90	122	36%	1	1	22	2100%	159	183	91	-50%	160	184	113	-39%
Colorado & Lincoln	27	15	37	147%	116	126	194	54%	143	141	231	64%	2	4	7	75%	25	37	41	11%	27	41	48	17%	16	3	18	500%	55	46	113	146%	71	49	131	167%
Columbus & Riverdale	20	16	24	50%	418	272	388	43%	438	288	412	43%	5	3	7	133%	172	117	153	31%	177	120	160	33%	12	8	13	63%	166	121	132	9%	178	129	145	12%
Concord & Doran**	15	9	29	222%	71	60	73	22%	86	69	102	48%	6	2	10	400%	40	33	36	9%	46	35	46	31%	4	7	13	86%	21	27	24	-11%	25	34	37	9%
Concord & Glenwood (HS)	4	16	6	-63%	825	834	589	-29%	829	850	595	-30%																								
Flower & Sonora	103	92	97	5%	78	124	75	-40%	181	216	172	-20%	34	28	21	-25%	33	60	26	-57%	67	88	47	-47%	36	28	30	7%	30	58	36	-38%	66	86	66	-23%
Foothill & Pennsylvania***	23	13	15	15%	60	59	50	-15%	83	72	65	-10%	8	2	9	350%	21	20	28	40%	29	22	37	68%	3	3		-	26	21		-	29	24	0	-100%
Glendale & Maple	43	37	35	-5%	325	302	455	51%	368	339	490	45%	12	11	8	-27%	130	108	155	44%	142	119	163	37%	14	16	20	25%	108	121	202	67%	122	137	222	62%
Glendale & Wilson	31	48	41	-15%	765	747	597	-20%	796	795	638	-20%	13	13	9	-31%	291	209	178	-15%	304	222	187	-16%	10	18	26	44%	252	297	246	-17%	262	315	272	-14%
Glenoaks & Chevy Chase	27	17	23	35%	130	108	119	10%	157	125	142	14%	8	0	8	-	51	50	55	10%	59	50	63	26%	7	8	3	-63%	54	50	32	-36%	61	58	35	-40%
Glenoaks & Grandview	36	37	72	95%	87	85	117	38%	123	122	189	55%	5	8	8	0%	42	26	35	35%	47	34	43	26%	11	17	17	0%	33	39	55	41%	44	56	72	29%
Glenoaks & Louise****	38	27	44	63%	222	179	140	-22%	260	206	184	-11%	11	2	7	250%	133	105	98	-7%	144	107	105	-2%	6	10	8	-20%	56	40	30	-25%	62	50	38	-24%
Honolulu & La Crescenta	44	33	90	173%	110	109	128	17%	154	142	218	54%	5	4	12	200%	47	44	39	-11%	52	48	51	6%	10	8	7	-13%	36	46	71	54%	46	54	78	44%
Honolulu & Oceanview	48	42	75	79%	857	520	905	74%	905	562	980	74%	5	9	8	-11%	174	76	135	78%	179	85	143	68%	15	9	8	-11%	316	76	359	372%	331	85	367	332%

Location	Total Comparable Data (All Time Periods)												Weekday 7-9 AM (Comparable Data)												Weekday 5-7 PM (Comparable Data)											
	Bicyclists				Pedestrians				Combined				Bicycle				Ped				Overall				Bicycle				Ped				Overall			
Intersection	2009	2010	2013	% change	2009	2010	2013	% change	2009	2010	2013	% change	2009	2010	2013	% change	2009	2010	2013	% change	2009	2010	2013	% change	2009	2010	2013	% change	2009	2010	2013	% change	2009	2010	2013	% change
Honolulu & Verdugo	36	64	65	2%	177	172	179	4%	213	236	244	3%	3	5	13	160%	29	39	44	13%	32	44	57	30%	19	8	12	50%	75	92	70	-24%	94	100	82	-18%
Jackson & California*****	4	13	6	-54%	102	127	184	45%	106	140	190	36%	0	1	1	0%	36	34	37	9%	36	35	38	9%	4	9	4	-56%	66	60	93	55%	70	69	97	41%
Kenneth & Sonora	23	22	40	82%	140	246	194	-21%	163	268	234	-13%	2	11	14	27%	49	46	45	-2%	51	57	59	4%	5	5	5	0%	58	51	71	39%	63	56	76	36%
Louise & Wilson	24	11	26	136%	314	304	374	23%	338	315	400	27%	0	0	7	-	99	61	86	41%	99	61	93	52%	17	6	12	100%	116	122	158	30%	133	128	170	33%
Maple & Chevy Chase	37	32	49	53%	319	271	301	11%	356	303	350	16%	10	5	7	40%	167	161	109	-32%	177	166	116	-30%	12	9	15	67%	97	74	126	70%	109	83	141	70%
San Fernando & Los Feliz	28	54	51	-6%	629	681	315	-54%	657	735	366	-50%	8	13	11	-15%	284	238	66	-72%	292	251	77	-69%	14	26	10	-62%	145	295	152	-48%	159	321	162	-50%
Verdugo & Harvard (HS)	22	16	12	-25%	804	854	745	-13%	826	870	757	-13%																								
Verdugo & Mountain	44	61	94	54%	200	234	455	94%	244	295	549	86%	4	10	17	70%	47	31	39	26%	51	41	56	37%	14	20	37	85%	116	155	369	138%	130	175	406	132%
Verdugo/Canada/Towne	n/a	n/a	117	-	n/a	n/a	542	-	n/a	n/a	659	-	n/a	n/a	29	-	n/a	n/a	169	-	n/a	n/a	198	-	n/a	n/a	25	-	n/a	n/a	289	-	n/a	n/a	314	-
Brand & Harvard	n/a	n/a	134	-	n/a	n/a	4,156	-	n/a	n/a	4,290	-	n/a	n/a	35	-	n/a	n/a	411	-	n/a	n/a	446	-	n/a	n/a	41	-	n/a	n/a	2109	-	n/a	n/a	2150	-
Fairmont & Flower	n/a	n/a	39	-	n/a	n/a	31	-	n/a	n/a	70	-	n/a	n/a	4	-	n/a	n/a	8	-	n/a	n/a	12	-	n/a	n/a	24	-	n/a	n/a	21	-	n/a	n/a	45	-
Glendale Riverwalk Bicycle Path	n/a	n/a	56	-	n/a	n/a	112	-	n/a	n/a	168	-	n/a	n/a	10	-	n/a	n/a	35	-	n/a	n/a	45	-	n/a	n/a	23	-	n/a	n/a	66	-	n/a	n/a	89	-
Broadway & Maynard	n/a	n/a	15	-	n/a	n/a	216	-	n/a	n/a	231	-	n/a	n/a	5	-	n/a	n/a	123	-	n/a	n/a	128	-	n/a	n/a	2	-	n/a	n/a	63	-	n/a	n/a	65	-
TOTAL (all locations)	856	872	1,463	68%	9,300	10,412	14,983	44%	10156	11,284	16,446	46%	172	164	305	86%	2,591	2,228	2,737	23%		2,392	3,042	27%	282	301	463	54%	2,834	3,430	5,987	75%	3,116	3,731	6,450	73%
TOTAL (only locations counted both in 2010 & 2013)	791	813	1,107	36%	9,045	10,330	10,049	-3%	9836	11,143	11,156	0%	163	155	227	46%	2,511	2,178	2,114	-3%		2,333	2,341	0%	269	290	348	20%	2,740	3,403	3,439	1%	3,009	3,693	3,787	3%

*2013 ped and bicycle volumes are missing 5-5:15 p.m. data

**2010 ped and bicycle volumes missing weekend 10 a.m. -12 p.m. data

***2013 ped and bicycle volumes missing 5-7 p.m. data

****2013 ped volumes missing weekend 10 a.m. -12 p.m. data for screenline location 785 only

*****2009 ped and bicycle volumes missing for weekend 10 a.m. -12 p.m.

Combined Bicycle and Pedestrian Volumes, by Count Period (weekend 10AM – 12 PM and weekday 3-5 PM): 2009, 2010, and 2013 Comparison

Location	Weekend 10 AM - 12 PM (Comparable Data)												Weekday 3-5 PM (Comparable Data)											
	Bicycle				Ped				Overall				Bicycle				Ped				Overall			
Intersection	2009	2010	2013	% change	2009	2010	2013	% change	2009	2010	2013	% change	2009	2010	2013	% change	2009	2010	2013	% change	2009	2010	2013	% change
Brand & Broadway	14	17	20	18%	425	457	306	-33%	439	474	326	-31%												
Brand & Chevy Chase	28	14	13	-7%	140	87	102	17%	168	101	115	14%												
Broadview & Oceanview	4	n/a	n/a	-	69	n/a	n/a	-	73	n/a	n/a	-												
Canada/Verdugo/Menlo	39	39	n/a	-	12	5	n/a	-	51	44	n/a	-												
Central & Americana Way*	n/a	8	7	-13%	n/a	892	1109	24%	n/a	900	1116	24%												
Central & Stocker	10	3	3	0%	176	185	146	-21%	186	188	149	-21%												
Colorado & Lincoln	9	8	12	50%	36	43	40	-7%	45	51	52	2%												
Columbus & Riverdale	3	5	4	-20%	80	34	103	203%	83	39	107	174%												
Concord & Doran**	5		6	-	10		13	-	15	0	19	-												
Concord & Glenwood (HS)													4	16	6	-63%	825	834	589	-29%	829	850	595	-30%
Flower & Sonora	33	36	46	28%	15	6	13	117%	48	42	59	40%												
Foothill & Pennsylvania***	12	8	6	-25%	13	18	22	22%	25	26	28	8%												
Glendale & Maple	17	10	7	-30%	87	73	98	34%	104	83	105	27%												
Glendale & Wilson	8	17	6	-65%	222	241	173	-28%	230	258	179	-31%												
Glenoaks & Chevy Chase	12	9	12	33%	25	8	32	300%	37	17	44	159%												
Glenoaks & Grandview	20	12	47	292%	12	20	27	35%	32	32	74	131%												
Glenoaks & Louise****	21	15	29	93%	33	34	12	-65%	54	49	41	-16%												
Honolulu & La Crescenta	29	21	71	238%	27	19	18	-5%	56	40	89	123%												
Honolulu & Oceanview	28	24	59	146%	367	368	411	12%	395	392	470	20%												

Location	Weekend 10 AM - 12 PM (Comparable Data)												Weekday 3-5 PM (Comparable Data)											
	Bicycle				Ped				Overall				Bicycle				Ped				Overall			
Intersection	2009	2010	2013	% change	2009	2010	2013	% change	2009	2010	2013	% change	2009	2010	2013	% change	2009	2010	2013	% change	2009	2010	2013	% change
Honolulu & Verdugo	14	51	40	-22%	73	41	65	59%	87	92	105	14%												
Jackson & California*****		3	1	-67%		33	54	64%	0	36	55	53%												
Kenneth & Sonora	16	6	21	250%	33	149	78	-48%	49	155	99	-36%												
Louise & Wilson	7	5	7	40%	99	121	130	7%	106	126	137	9%												
Maple & Chevy Chase	15	18	27	50%	55	36	66	83%	70	54	93	72%												
San Fernando & Los Feliz	6	15	30	100%	200	148	97	-34%	206	163	127	-22%												
Verdugo & Harvard (HS)													22	16	12	-25%	804	854	745	-13%	826	870	757	-13%
Verdugo & Mountain	26	31	40	29%	37	48	47	-2%	63	79	87	10%												
Verdugo/Canada/Town e	n/a	n/a	63	-	n/a	n/a	84	-	n/a	-	147	-												
Brand & Harvard	n/a	n/a	58	-	n/a	n/a	1,636	-	n/a	-	1694	-												
Fairmont & Flower	n/a	n/a	11	-	n/a	n/a	2	-	n/a	-	13	-												
Glendale Riverwalk Bicycle Path	n/a	n/a	23	-	n/a	n/a	11	-	n/a	-	34	-												
Broadway & Maynard	n/a	n/a	8	-	n/a	n/a	30	-	n/a	-	38	-												
TOTAL (all locations)	376	375	677	81%	2,246	3,066	4,925	61%	2,622	3,441	5,602	63%	26	32	18	-44%	1,629	1,688	1,334	-21%	1,655	1,720	1,352	-21%
TOTAL (only locations counted both in 2010 & 2013)	333	336	514	53%	2,165	3,061	3,162	3%	2,498	3,397	3,676	8%	26	32	18	-44%	1,629	1,688	1,334	-21%	1,655	1,720	1,352	-21%

*2013 ped and bicycle volumes are missing 5-5:15 p.m. data
**2010 ped and bicycle volumes missing weekend 10 AM -12 p.m. data
***2013 ped and bicycle volumes missing 5-7 p.m. data
****2013 ped volumes missing weekend 10 a.m. -12 p.m. data for screenline location 785 only
*****2009 ped and bicycle volumes missing for weekend 10 a.m. -12 p.m.

Appendix B

Overall Bicycle and Pedestrian Volumes, by Count Period, 2013

Location	Total (All Time Periods)			Total Weekday 7-9 AM			Total Weekday 5-7 PM			Total Weekend 10 AM - 12 PM			Total Weekday 3-5 PM		
	Bike	Ped	Combined	Bike	Ped	Combined	Bike	Ped	Combined	Bike	Ped	Combined	Bike	Ped	Combined
Brand & Broadway	111	2,237	2,348	31	511	542	51	1,031	1,082	29	695	724			
Brand & Chevy Chase	101	665	766	31	198	229	46	241	287	24	226	250			
Central & Americana Way*	73	3,675	3,748	16	323	339	47	838	885	10	2,514	2,524			
Central & Stocker	45	671	716	11	209	220	27	154	181	7	308	315			
Colorado & Lincoln	77	366	443	18	67	85	31	222	253	28	77	105			
Columbus & Riverdale	47	800	847	12	316	328	23	261	284	12	223	235			
Concord & Doran*	63	147	210	15	65	80	31	49	80	17	33	50			
Concord & Glenwood (HS)	11	920	931										11	920	931
Flower & Sonora	237	173	410	63	83	146	67	69	136	107	21	128			
Foothill & Pennsylvania**	22	111	133	13	61	74			0	9	50	59			
Glendale & Maple	74	866	940	16	310	326	37	374	411	21	182	203			
Glendale & Wilson	101	1,166	1,267	18	335	353	45	516	561	38	315	353			
Glenoaks & Chevy Chase	64	232	296	16	107	123	12	56	68	36	69	105			
Glenoaks & Grandview	108	216	324	18	69	87	26	84	110	64	63	127			
Glenoaks & Louise***	94	290	384	13	141	154	17	124	141	64	25	89			
Honolulu & La Crescenta	121	231	352	19	90	109	10	109	119	92	32	124			
Honolulu & Oceanview	109	1,826	1,935	11	251	262	15	677	692	83	898	981			
Honolulu & Verdugo	169	330	499	22	93	115	23	126	149	124	111	235			
Jackson & California	22	385	407	5	79	84	10	188	198	7	118	125			
Kenneth & Sonora	70	412	482	17	86	103	8	155	163	45	171	216			
Louise & Wilson	65	725	790	17	153	170	27	313	340	21	259	280			

Location	Total (All Time Periods)			Total Weekday 7-9 AM			Total Weekday 5-7 PM			Total Weekend 10 AM - 12 PM			Total Weekday 3-5 PM		
	Bike	Ped	Combined	Bike	Ped	Combined	Bike	Ped	Combined	Bike	Ped	Combined	Bike	Ped	Combined
Maple & Chevy Chase	89	537	626	20	196	216	33	219	252	36	122	158			
San Fernando & Los Feliz	88	730	818	27	259	286	25	294	319	36	177	213			
Verdugo & Harvard (HS)	18	899	917										18	899	917
Verdugo & Mountain	188	875	1,063	35	215	250	84	573	657	69	87	156			
Verdugo/Canada/Towne	117	542	659	29	169	198	25	289	314	63	84	147			
Brand & Harvard	134	4,156	4,290	35	411	446	41	2,109	2,150	58	1,636	1,694			
Fairmont & Flower	39	31	70	4	8	12	24	21	45	11	2	13			
Glendale Riverwalk Bike Path	56	112	168	10	35	45	23	66	89	23	11	34			
Broadway & Maynard****	15	216	231	5	123	128	2	63	65	5	30	38			
TOTAL (all locations)	2,528	24,542	27,070	547	4,963	5,510	810	9,221	10,031	1,142	8,539	9,681	29	1,819	1,848

*2013 ped volumes are missing 5-5:15 p.m. data

**2013 ped volumes missing 5-7 p.m. data

***2013 ped volumes missing weekend 10 a.m. -12 p.m. data for screenline location 785 only

****2013 ped volumes missing weekday 7-9 a.m. data

Appendix C

Primary Collision Factors (PCFs) for Bicycle Injury Collisions, 2007-2011

PCF Code	Primary Collision Factor	#	%
5	Wrong Side of Road	80	31.9%
9	Automobile Right of Way	51	20.3%
8	Improper Turning	45	17.9%
17	Other Hazardous Violation	27	10.8%
12	Traffic Signals and Signs	23	9.2%
3	Unsafe Speed	16	6.4%
6	Improper Passing	7	2.8%
-	Not Stated	6	2.4%
0	Unknown	5	2.0%
10	Pedestrian Right of Way	4	1.6%
1	Driving or Bicycling Under the Influence of Alcohol or Drug	3	1.2%
7	Unsafe Lane Change	3	1.2%
18	Other Than Driver (or Pedestrian)	3	1.2%
11	Pedestrian Violation	2	0.8%
21	Unsafe Starting or Backing	1	0.4%
	Total	251	100.0%

California Vehicle Code (CVC) Violations for Bicycle Injury Collisions, 2007-2011

CVC Violation Code	Description of Violation	#	%
21202 A	Bicyclists traveling at lower speeds that other traffic must remain on the right-hand edge of the road, unless turning.	52	20.7%
22107	No driver shall turn or switch lanes until they can do so with reasonable safety, and only after giving the appropriate signal.	40	15.9%
21650 1	Vehicle Code 21650 does not prohibit bicyclists to use the shoulder of a highway, sidewalks, or bicycle path within a highway.	23	9.2%
21804 A	The driver of any vehicle about to enter or cross a road from any public or private property shall yield to all traffic.	19	7.6%
22350	No person shall drive a vehicle upon a road at a speed greater than is reasonable or prudent under given conditions.	16	6.4%
Not stated		14	5.6%
21801 A	When turning left or attempting a U-turn, the driver shall yield to all vehicles approaching from the opposite direction.	14	5.6%
21453 A	A driver must stop at a marked line at a red light or arrow. If there isn't one, he/she must stop before entering the intersection.	13	5.2%
22517	No person shall open the door of a vehicle on the side available to moving traffic unless it is reasonably safe to do so.	13	5.2%
21802 A	When approaching a stop sign the driver of a vehicle must yield to crossing pedestrians and passing traffic.	12	4.8%
22450 A	A driver must stop at the limit line at an intersection with a stop sign, or before entering the intersection if a line isn't present.	10	4.0%
21200 A	Every bicyclist upon a road has all the rights and is subject to all the provisions applicable to the driver of a motor vehicle.	5	2.0%
21663	No person shall operate or move a motor vehicle upon a sidewalk except as may be necessary to enter or leave adjacent property.	5	2.0%
21755	A driver may overtake another vehicle upon the right only under conditions permitting such movement in safety.	4	1.6%
21950 A	When approaching a circular red light or red arrow, a driver must stop unless there is another signal permitting movement.	4	1.6%
21650	Upon all roads, a vehicle shall be driven upon the right half of the roadway, except during conditions listed in VC 21650.	3	1.2%
21658 A	A vehicle shall be driven within a single lane and shall not	3	1.2%

CVC Violation Code	Description of Violation	#	%
	be moved from the lane until such movement can be made with reasonable safety.		
21750	Drivers overtaking another vehicle shall pass to the left at a safe distance without interfering with the safety of others.	3	1.2%
21200	A person riding a bicycle upon a highway has all the rights and is subject to all the provisions applicable to the driver of a vehicle.	2	0.8%
21453 B	After stopping at a red light, a driver may make a legal right turn only after yielding to pedestrians and passing cars.	2	0.8%
22100 A	When turning right from one road to another, drivers must stay in the lane during the turn and follow signs on the intersection.	2	0.8%
23153 A	It is unlawful for a person under 21 years of age to have over 0.05 Blood Alcohol Content and to operate a vehicle.	2	0.8%
21200 5	Every bicyclist upon a road has all the rights and is subject to all the provisions applicable to the driver of a motor vehicle.	1	0.4%
21202	Overtaking and passing another bicycle or vehicle is only allowed when proceeding in the same direction.	1	0.4%
21208 B	No person operating a bicycle shall leave a bicycle lane until the movement can be made with reasonable safety and then only after giving an appropriate signal in the manner provided in Chapter 6 (commencing with Section 22100) in the event that any vehicle may be affected by the movement.	1	0.4%
21451 A	Any driver, including one turning, shall yield to traffic and pedestrians lawfully within the intersection or an adjacent crosswalk.	1	0.4%
21453 D	Unless otherwise directed by a pedestrian control signal, a pedestrian facing any steady red signal shall not enter the road.	1	0.4%
21460 A	When double parallel solid lines are in place, no person driving a vehicle shall drive to the left thereof, except as permitted in this section.	1	0.4%
21717	Whenever it is necessary for the driver of a motor vehicle to cross a bicycle lane that is adjacent to his lane of travel to make a turn, the driver shall drive the motor vehicle into the bicycle lane prior to making the turn and shall make the turn pursuant to Section 22100.	1	0.4%
21800 B	A vehicle shall yield to the vehicle to its right when the two vehicles have entered the intersection at the same time.	1	0.4%
21801	Once a vehicle turning left (or making a U-turn) has started turning, the traffic from opposite direction must yield to them.	1	0.4%
21804	When attempting to enter or to cross a road, the driver of a	1	0.4%

CVC Violation Code	Description of Violation	#	%
	vehicle must yield to all passing traffic before proceeding.		
21804 B	Drivers must yield to vehicles that are in the process of crossing or entering the road, provided they followed VC 21804 A.	1	0.4%
21950 B	Even with the right of way, pedestrians are to exercise caution when at crosswalks, and may not purposely delay traffic.	1	0.4%
22100 B	Drivers approaching a left turn stay as close as possible to the left-hand edge of the road and stay in that lane as they turn.	1	0.4%
22102	No person in a business district shall make a U-turn, except at an intersection, or on a divided highway where an opening has been provided in accordance with Section 21651. This turning movement shall be made as close as practicable to the extreme left-hand edge of the lanes moving in the driver's direction of travel immediately prior to the initiation of the turning movement, when more than one lane in the direction of travel is present.	1	0.4%
22106	No person shall start a vehicle stopped, standing, or parked on a highway, nor shall any person back a vehicle on a highway until such movement can be made with reasonable safety.	1	0.4%
Total		251	100.0%

Primary Collision Factors (PCFs) for Pedestrian Injury Collisions, 2007-2011

PCF Code	PCF	#	%
10	Pedestrian Right of Way	278	54.0%
11	Pedestrian Violation	113	21.9%
21	Unsafe Starting or Backing	23	4.5%
3	Unsafe Speed	21	4.1%
8	Improper Turning	18	3.5%
0	Unknown	16	3.1%
-	Not Stated	16	3.1%
12	Traffic Signals and Signs	13	2.5%
9	Automobile Right of Way	10	1.9%
17	Other Hazardous Violation	5	1.0%
6	Improper Passing	4	0.8%
1	Driving or Bicycling Under the Influence of Alcohol or Drug	3	0.6%
5	Wrong Side of Road	2	0.4%
22	Other Improper Driving	2	0.4%
4	Following Too Closely	1	0.2%
13	Hazardous Parking	1	0.2%
18	Other Than Driver (or Pedestrian)	1	0.2%
	Total	515	100.0%

California Vehicle Code (CVC) Violations for Pedestrian Injury Collisions, 2007-2011

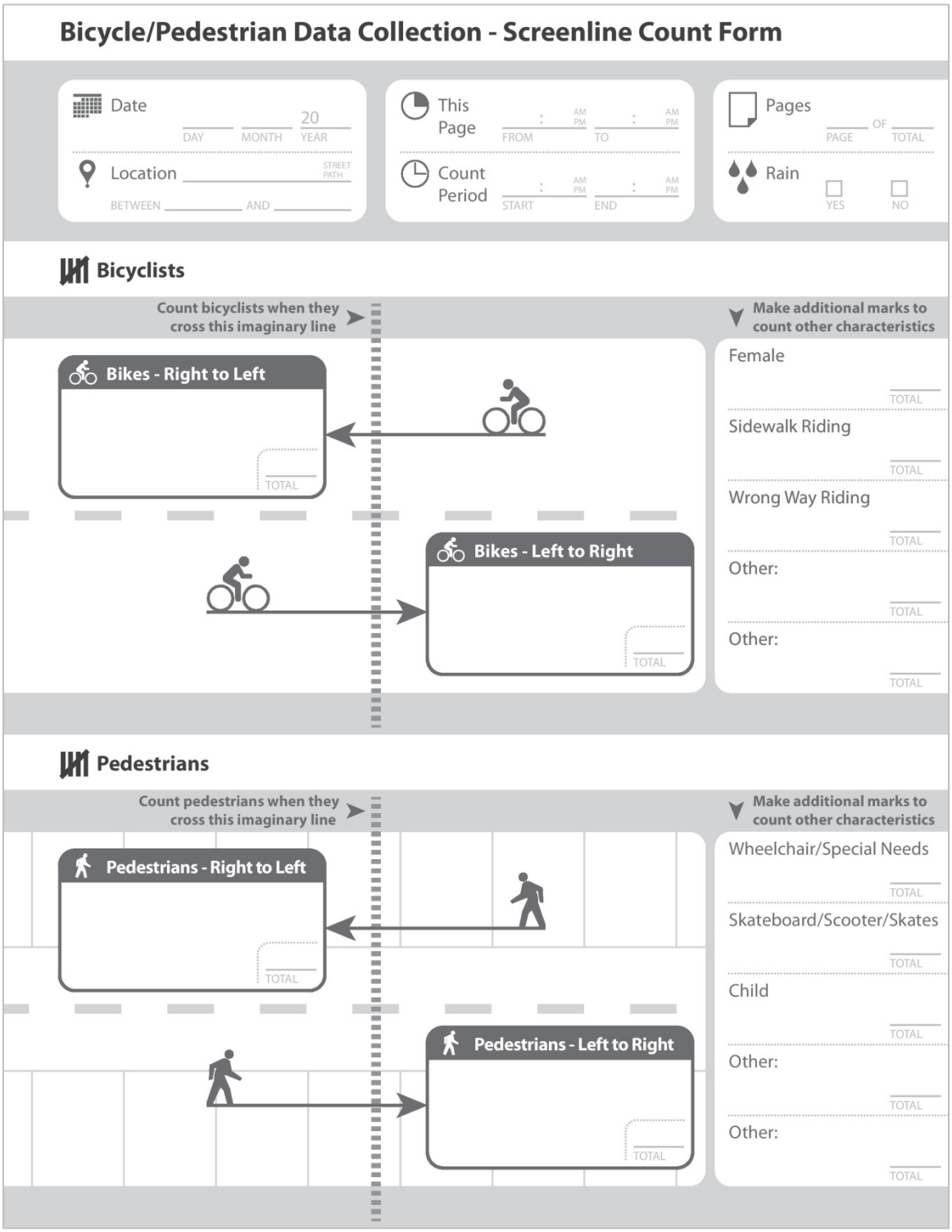
CVC Violation Code	Description of Violation	#	%
21950 A	When approaching a circular red light or red arrow, a driver must stop unless there is another signal permitting movement.	254	49.3%
21954 A	Every pedestrian upon a roadway at any point other than within a marked crosswalk or within an unmarked crosswalk at an intersection shall yield the right-of-way to all vehicles upon the roadway so near as to constitute an immediate hazard.	64	12.4%
22106	No person shall start a vehicle stopped, standing, or parked on a highway, nor shall any person back a vehicle on a highway until such movement can be made with reasonable safety.	23	4.5%
21952	The driver of any motor vehicle, prior to driving over or upon any sidewalk, shall yield the right-of-way to any pedestrian approaching thereon.	21	4.1%
22350	No person shall drive a vehicle upon a road at a speed greater than is reasonable or prudent under given conditions.	21	4.1%
22107	No driver shall turn or switch lanes until they can do so with reasonable safety, and only after giving the appropriate signal.	17	3.3%
21456 B	Flashing or steady "DON'T WALK" or "WAIT" or approved "Upraised Hand" symbol. No pedestrian shall start to cross the roadway in the direction of the signal, but any pedestrian who has partially completed crossing shall proceed to a sidewalk or safety zone or otherwise leave the roadway while the "WAIT" or "DON'T WALK" or approved "Upraised Hand" symbol is showing.	13	2.5%
21950 B	Even with the right of way, pedestrians are to exercise caution when at crosswalks, and may not purposely delay traffic.	11	2.1%
21955	Between adjacent intersections controlled by traffic control signal devices or by police officers, pedestrians shall not cross the roadway at any place except in a crosswalk.	10	1.9%
21453 D	Unless otherwise directed by a pedestrian control signal, a pedestrian facing any steady red signal shall not enter the road.	8	1.6%
21453 A	A driver must stop at a marked line at a red light or arrow. If there isn't one, he/she must stop before entering the intersection.	6	1.2%
22450 A	A driver must stop at the limit line at an intersection with a stop sign, or before entering the intersection if a line isn't present.	6	1.2%
21453 B	After stopping at a red light, a driver may make a legal right turn only after yielding to pedestrians and passing cars.	4	0.8%
21801 A	When turning left or attempting a U-turn, the driver shall yield to all vehicles approaching from the opposite direction.	4	0.8%
21951	Whenever any vehicle has stopped at a marked crosswalk or at any unmarked crosswalk at an intersection to permit a pedestrian to cross the roadway the driver of any other vehicle approaching from the rear shall not overtake and pass the stopped vehicle.	4	0.8%
21456 A	"WALK" or approved "Walking Person" symbol. A pedestrian	3	0.6%

CVC Violation Code	Description of Violation	#	%
	facing the signal may proceed across the roadway in the direction of the signal, but shall yield the right-of-way to vehicles lawfully within the intersection at the time that signal is first shown.		
21663	No person shall operate or move a motor vehicle upon a sidewalk except as may be necessary to enter or leave adjacent property.	2	0.4%
21953	Whenever any pedestrian crosses a roadway other than by means of a pedestrian tunnel or overhead pedestrian crossing, if a pedestrian tunnel or overhead crossing serves the place where the pedestrian is crossing the roadway, such pedestrian shall yield the right-of-way to all vehicles on the highway so near as to constitute an immediate hazard. This section shall not be construed to mean that a marked crosswalk, with or without a signal device, cannot be installed where a pedestrian tunnel or overhead crossing exists.	2	0.4%
21954 B	The provisions of this section shall not relieve the driver of a vehicle from the duty to exercise due care for the safety of any pedestrian upon a roadway.	2	0.4%
22517	No person shall open the door of a vehicle on the side available to moving traffic unless it is reasonably safe to do so.	2	0.4%
23152 A	It is unlawful for a person who is under the influence of any alcoholic beverage to drive a vehicle.	2	0.4%
20001 A	The driver of a vehicle involved in an accident resulting in injury to a person, other than himself or herself, or in the death of a person shall immediately stop the vehicle at the scene of the accident and shall fulfill the requirements of Sections 20003 and 20004.	1	0.2%
21200	A person riding a bicycle upon a highway has all the rights and is subject to all the provisions applicable to the driver of a vehicle.	1	0.2%
21202 A	Bicyclists traveling at lower speeds that other traffic must remain on the right-hand edge of the road, unless turning.	1	0.2%
21451 C	A pedestrian facing a circular green signal, unless prohibited by sign or otherwise directed by a pedestrian control signal as provided in Section 21456, may proceed across the roadway within any marked or unmarked crosswalk, but shall yield the right-of-way to vehicles lawfully within the intersection at the time that signal is first shown.	1	0.2%
21457 A	Flashing red (stop signal): When a red lens is illuminated with rapid intermittent flashes, a driver shall stop at a clearly marked limit line, but if none, before entering the crosswalk on the near side of the intersection, or if none, then at the point nearest the intersecting roadway where the driver has a view of approaching traffic on the intersecting roadway before entering it, and the driver may proceed subject to the rules applicable after making a	1	0.2%

CVC Violation Code	Description of Violation	#	%
	stop at a stop sign.		
21460 5	(a) The Department of Transportation and local authorities in their respective jurisdictions may designate a two-way left-turn lane on a highway. A two-way left-turn lane is a lane near the center of the highway set aside for use by vehicles making left turns in both directions from or into the highway. (b) Two-way left-turn lanes shall be designated by distinctive roadway markings consisting of parallel double yellow lines, interior line dashed and exterior line solid, on each side of the lane. The Department of Transportation may determine and prescribe standards and specifications governing length, width, and positioning of the distinctive pavement markings. All pavement markings designating a two-way left-turn lane shall conform to the Department of Transportation's standards and specifications. (c) A vehicle shall not be driven in a designated two-way left-turn lane except when preparing for or making a left turn from or into a highway or when preparing for or making a U-turn when otherwise permitted by law, and shall not be driven in that lane for more than 200 feet while preparing for and making the turn or while preparing to merge into the adjacent lanes of travel. A left turn or U-turn shall not be made from any other lane where a two-way left-turn lane has been designated. (d) This section shall not prohibit driving across a two-way left-turn lane. (e) Raised pavement markers may be used to simulate painted lines described in this section when such markers are placed in accordance with standards established by the Department of Transportation.	1	0.2%
21650	Upon all roads, a vehicle shall be driven upon the right half of the roadway, except during conditions listed in VC 21650.	1	0.2%
21703	The driver of a motor vehicle shall not follow another vehicle more closely than is reasonable and prudent, having due regard for the speed of such vehicle and the traffic upon, and the condition of, the roadway.	1	0.2%
21802 A	When approaching a stop sign the driver of a vehicle must yield to crossing pedestrians and passing traffic.	1	0.2%
21804 A	The driver of any vehicle about to enter or cross a road from any public or private property shall yield to all traffic.	1	0.2%
21956 A	No pedestrian may walk upon any roadway outside of a business or residence district otherwise than close to his or her left-hand edge of the roadway.	1	0.2%
21963	A totally or partially blind pedestrian who is carrying a predominantly white cane (with or without a red tip), or using a	1	0.2%

CVC Violation Code	Description of Violation	#	%
	guide dog, shall have the right-of-way, and the driver of any vehicle approaching this pedestrian, who fails to yield the right-of-way, or to take all reasonably necessary precautions to avoid injury to this blind pedestrian, is guilty of a misdemeanor, punishable by imprisonment in the county jail not exceeding six months, or by a fine of not less than five hundred dollars ($500) nor more than one thousand dollars ($1,000), or both. This section shall not preclude prosecution under any other applicable provision of law.		
22515 A	No person driving, or in control of, or in charge of, a motor vehicle shall permit it to stand on any highway unattended without first effectively setting the brakes thereon and stopping the motor thereof.	1	0.2%
23153 A	It is unlawful for a person under 21 years of age to have over 0.05 Blood Alcohol Content and to operate a vehicle.	1	0.2%
Not stated		34	6.6%
Total		515	100.0%

Appendix D


Bicycle/Pedestrian Data Collection - Screenline Count Form
Date
DAY
MONTH
20
YEAR
Location
STREET PATH
BETWEEN
AND
This Page
FROM
TO
Count Period
START
END
Pages
PAGE
OF
TOTAL
Rain
YES
NO
Bicyclists
Count bicyclists when they cross this imaginary line
Make additional marks to count other characteristics
Bikes - Right to Left
TOTAL
Bikes - Left to Right
TOTAL
Female
TOTAL
Sidewalk Riding
TOTAL
Wrong Way Riding
TOTAL
Other:
TOTAL
Other:
TOTAL
Pedestrians
Count pedestrians when they cross this imaginary line
Make additional marks to count other characteristics
Pedestrians - Right to Left
TOTAL
Pedestrians - Left to Right
TOTAL
Wheelchair/Special Needs
TOTAL
Skateboard/Scooter/Skates
TOTAL
Child
TOTAL
Other:
TOTAL
Other:
TOTAL

Appendix E

Bicycle Injury Collisions by Year and Severity of Injury, 2007-2011

Severity	2007	2008	2009	2010	2011
Fatal	0	0	0	0	0
Injury	37	45	41	60	68
Total	37	45	41	60	68
Average	50.2	50.2	50.2	50.2	50.2

Pedestrian Injury Collisions by Year and Severity of Injury, 2007-2011

Severity	2007	2008	2009	2010	2011
Fatal	4	2	0	3	1
Injury	122	88	113	91	91
Total	126	90	113	94	92
Average	104.5	104.5	104.5	104.5	104.5

Pedestrian and Bicycle Injury Collisions by Month, 2007-2011

Type	Pedestrian	Bicyclist
January	57	14
February	44	13
March	41	16
April	43	23
May	42	22
June	37	27
July	36	31
August	33	32
September	34	29
October	52	29
November	52	24
December	56	16

Pedestrian and Bicycle Injury Collisions by Time of Day, 2007-2011

Time	Pedestrian	Bicyclist
12-12:59 a.m.	1	0
1-1:59 a.m.	0	1
2-2:59 a.m.	2	0
3-3:59 a.m.	0	0
4-4:59 a.m.	0	1
5-5:59 a.m.	2	1
6-6:59 a.m.	6	4
7-7:59 a.m.	14	10
8-8:59 a.m.	33	12
9-9:59 a.m.	22	17
10-10:59 a.m.	30	13
11-11:59 a.m.	16	19
12-12:59 p.m.	32	23
1-1:59 p.m.	44	19
2-2:59 p.m.	41	13
3-3:59 p.m.	43	36
4-4:59 p.m.	40	27
5-5:59 p.m.	54	22
6-6:59 p.m.	57	22
7-7:59 p.m.	22	18
8-8:59 p.m.	28	5
9-9:59 p.m.	22	7
10-10:59 p.m.	12	3
11-11:59 p.m.	6	3

Pedestrian and Bicycle Injury Collisions by Day of Week, 2007-2011

Day of Week	Pedestrian	Bicyclist
Sunday	31	26
Monday	84	37
Tuesday	94	47
Wednesday	77	38
Thursday	78	52
Friday	98	40
Saturday	65	36

Pedestrian and Bicycle Injury Collisions by Age, 2007-2011

Age of Injured Party	Pedestrian	Bicyclist
0-4 years	7	0
5-9 years	15	7
10-14 years	34	37
15-19 years	64	43
20-24 years	27	32
25-29 years	36	31
30-34 years	20	16
35-44 years	50	25
45-54 years	77	40
55-64 years	60	9
65+ years	149	8
Unknown	1	-

Pedestrian and Bicycle Injury Collisions by Gender, 2007-2011

Gender	Pedestrian	Bicyclist
Male	261	191
Female	248	39
Unknown	31	18